Developing Evidence-Based Measures of Care for Breast Cancer

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DEVELOPING EVIDENCE-BASED MEASURES OF CARE FOR BREAST CANCER

As our health care system has increasingly moved towards a competitive market model, pressures have mounted for more and better information on the quality of health services. Health services researchers are interfacing with corporate executives, health care administrators, and clinicians to mold strategies and techniques for measuring provider performance to produce accurate information that all parties can confidently use in their decision making. Developing meaningful measures of quality performance is one of the first challenges faced.

Performance measurement involves both assessing the quality of the care delivered by a provider and representing that quality assessment in terms suitable for fair comparison with other providers. According to the Institute of Medicine (IOM), the quality of care is "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[1] To measure performance, one must collect and assess comparable information on the quality of the care delivered by specific health care providers. Performance can be measured at the level of the individual, e.g., physician, or the organization, e.g., health care plan, hospital, medical group, specialty, or geographic area. The findings are then compared to those of other individuals or groups or to a benchmark such as a goal or standard.

Mammography screening is a frequent focus of performance measurement. The HEDIS 3.0 reporting set measure related to breast cancer, for example, is the rate of mammography screening among women aged 52 through 69.[2] Breast cancer is multi-faceted, however, and performance measurement is possible across a whole spectrum of care. In this paper, we focus on evidence defining quality of the care which follows an abnormal finding on a mammogram or physical exam.

Performance measures can report on the processes of care, what physicians and nurses do to patients, as well as the outcomes of the care experienced by the patient.[3,4] For example, the rate of radiation therapy among patients treated with breast conserving surgery defines a process measure, while patient-reported well being and satisfaction are examples of outcome measures. As suggested by the IOM definition of quality, performance measures should be supported by scientifically sound research demonstrating that better performance of the processes is associated with improved outcomes for patients with breast cancer. In many cases, performance measures are derived from practice guidelines which, in turn, were based on scientific evidence and expert judgment. To develop meaningful performance measures, one must identify the practice guidelines and underlying body of scientific evidence across the spectrum of breast cancer care. The purpose of this paper is to provide an overview of the existing practice guidelines and evidence showing which processes of breast cancer care lead to desired patient outcomes.

METHODS

To identify breast cancer practice guidelines and recommended process measures, we searched the MEDLINE database for English-language articles published during or after 1990 on the subject of breast neoplasms and the title word "consensus" or key word "clinical practice guidelines." We supplemented this with a search of the 1993 to present database on the subject of breast neoplasms and any of the following: a) keyword "performance measurement;" b) subject "health services research;" and c) subject "quality of health care;" and d) keyword "quality indicators." We also screened references in known literature on the subject and

conducted additional searches of the HealthStar, Cancerlit, and Embase databases.

To identify evidence of linkages between processes and outcomes of breast cancer care, we searched the computerized bibliographic database MEDLINE for English-language articles published during the last five years (1993 to present) reporting results of studies analyzing the relationship between any of a number of processes and outcomes. Table 1 shows the search topics, specific subject headings and keywords, and the number of citations identified. The citation titles, and in many cases the abstracts, were reviewed by the researchers for data-based findings on any relationship between a specified process and patient outcomes. We have not assessed the quality of the evidence itself.

We are interested in processes of breast cancer care applicable to the diagnosis and the first year of care for elderly patients diagnosed with early stage breast cancer. Our conceptual framework views the spectrum of processes in terms of eight domains of recognition and diagnosis, initial surgical treatment, patient choice of treatment, radiotherapy treatments, chemotherapy treatments, tamoxifen or other adjuvant treatments, care following initial surgery/radiotherapy, and treatment of morbid and comorbid symptoms, signs, and conditions.

PUBLISHED PRACTICE GUIDELINES

According to the Institute of Medicine (IOM) definition, practice guidelines are "systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances."[5] Performance measures, on the other hand, are developed as tools for evaluating conformity to practice guidelines. Knowledge of the prevailing practice guidelines is therefore critical to performance measurement development.

A number of organizations from around the world have undertaken major efforts to develop evidence-based process guidelines or recommendations. The search method described above located 23 published accounts of practice guidelines (after 1990) for early stage breast cancer care. These guideline efforts are listed on Table 2 (starting with those most recent), along with indicators of the domains of care addressed by each. They range from international efforts such as the International Conference on Adjuvant Therapy of Primary Breast Cancer Treatment to national-level efforts in the United States, England, Australia, and elsewhere to provider-level guidelines such as those of the Texas Oncology P.A. Included among the sponsors of the United States efforts are the National Cancer Institute (NCI), the National Institutes of Health (NIH), the American Society of Clinical Oncology (ASCO), the National Comprehensive Cancer Network (NCCN), the American College of Radiologists (ACR), the American College of Surgeons, College of American Pathologists (CAP), and the Society of Surgical Oncology (SSO).

Some guideline sets focus specifically on one domain of care to early stage breast cancer patients, or even to one process area within a domain. An example are the recommendations on fine needle aspiration (FNA) biopsy put forth by the National Cancer Institute sponsored conference in 1996.[6] Other guideline sets cover multiple domains. The practice guidelines published by the Canadian Medical Association (CMA), the National Health Service Executive Initiative in Great Britain (NHS), the British Association of Surgical Oncology, and the National Health and Medical Research Council in Australia, for example, include recommendations in all eight domains of care.

Tables 3 through 10 present the specific recommendations by domain. Each table gives all guidelines pertaining to that domain of care. Guidelines which address more than one domain (e.g., a combination of chemotherapy and tamoxifen) are repeated under each relevant domain.

The guideline formats vary somewhat among the different organizations. Most were developed as recommendations for provider process, but some sets include evidence statements or structure recommendations as well. We left these latter types in our tables because we wished to accurately reflect the full spectrum of the guideline set and because the evidence and structural statements have direct implications for process.

PROPOSED PROCESS MEASURES

Some organizations and research teams have proposed, and in some cases implemented, performance measure sets. Table 11 illustrates the variety of measure proponents and the domains in which their measures apply. Tables 12 - 19 present these measures by the domain addressed. As with the guidelines, the formats used by the different groups vary.

PROCESS-OUTCOME RESEARCH

The extent of the documentation of relationships between processes of care and long-term outcomes varies across and within domains of care. Not all aspects of breast cancer care that are believed to be associated with improved outcomes have been documented with a process-outcome link in the elderly. Where data regarding the elderly are available, we have documented them. However, we do not believe a quality of care model for Medicare patients would be complete if it did not supplement randomized control trial data specifically assessing effectiveness in the elderly with other clinically important data.

Relevant outcomes for breast cancer patients include survival, recurrence, patient satisfaction, short and long-term functional status and quality of life. In the following sections we provide a brief overview of existing evidence for process-outcome relationships within the eight domains of care.

Domain 1: Recognition and Diagnosis of the Breast Problem, Severity Assessment, and Referral

Early detection of breast cancer is associated with earlier stage of diagnosis as well as earlier treatment interventions.[7] Both early stage at diagnosis and early intervention are associated with improved patient outcomes. A satisfactory experience for the patient at the time of diagnosis is useful for assuring patient compliance as well as for encouraging patient compliance with future breast cancer associated interventions. Several studies have described the angst of women whose initial diagnostic work-up is incorporated into surgical treatment with mastectomy. Women who have time to process the diagnosis of breast cancer prior to undergoing mastectomy have better psychosocial outcomes.[8,9,10]

Domain 2: Initial Surgical Treatment

Type of Surgery

The literature clearly documents similar survival outcomes for women with early stage breast cancer treated with mastectomy as compared with breast conserving surgery. Six large prospective randomized trials have assessed mortality and recurrence following mastectomy as compared with breast conserving surgery.[11-12] The earliest study from the National Cancer Institute in Milan, Italy showed after a minimum of 10 years of follow-up no detected differences in relapse-free or overall survival rates for either node negative or node positive women.[13] The National Surgical Adjuvant Breast and Bowel Project (NSABP-B-06) randomized women to a three-arm trial comparing mastectomy with lumpectomy without radiotherapy and to lumpectomy

with radiotherapy. After more than eight years of follow-up no differences in distant disease-free survival or overall survival rates have been noted between women with mastectomy and women with lumpectomy with or without radiotherapy.[14] The use of radiotherapy was not associated with improvements in survival but was associated with a significant reduction in the incidence of local recurrence of the breast. The probability of a recurrence in the breast was 12% for patients with radiotherapy as compared to 42% for patients without radiotherapy. The improved recurrence rate with radiotherapy was noted regardless of nodal status, tumor size, and patient age.

Similar findings of equivalent outcomes (survival and recurrence) have been noted by studies of the European Organization for Research and Treatment of Cancer (EORTC),[15] the Danish Breast Cancer Cooperative Group Trial,[16] and the National Cancer Institute Early Breast Cancer Trial[17] which compare mastectomy with breast conserving therapy. Harris has emphasized recurrence as the problem following breast-conserving treatment with recurrence rates varying at 8-10 years between 4% and 20% following breast conserving treatments (with radiotherapy) as compared with rates of recurrence of 2% to 9% following mastectomy.[18]

Analysis of psychological adjustment and quality of life after surgery found no significant differences in mood, adjustment, quality of life, and functional status between patients with breast conserving surgery versus mastectomy.[19,20] However, researchers found that mastectomy patients reported more body image and clothing problems. This difference did not appear to affect mood or quality of life. There was also some suggestion that the added burden for breast conserving surgery of radiation therapy may slow mood recovery during the early post-surgical period.[Error! Bookmark not defined.] Table 20 summarizes the evidence regarding psychosocial/quality of life outcomes for breast conserving surgery versus mastectomy.

Use of Estrogen Receptors to Determine Optimal Therapy

During the early 1980s substantial progress was made regarding the use of estrogen receptors to predict the responsiveness of breast cancer to hormonal interventions. Some have advocated the use of tamoxifen as adjuvant therapy for all post menopausal women making the need to obtain estrogen receptors less important. However, even if one were to argue that all post menopausal women should get adjuvant hormonal intervention, then benefits from knowing estrogen receptor status at the time of diagnosis would still be apparent for women with recurrence since initial estrogen receptor status would be useful in planning therapy at the time of recurrence.[21] Accordingly, assessment of estrogen receptors at the time of diagnosis should be obtained.

Clear Surgical Margins

Clear surgical margins remain one of the most important predictors of recurrence. Multiple studies have shown that clear surgical margins predict less recurrence.[22,23] Accordingly, where possible clear margins should be obtained and decisions regarding radiation therapy should be influenced by margin status.

Use of Axillary Node Dissection

Historically, axillary lymph node dissection has been recommended to assist in the prognostication of breast cancer patients. During the decades when treatment definitively depended upon the extent of lymph node involvement, axillary lymph node dissection became a standard component of the protocol of many surgeons caring for breast cancer. With time, two new lines of evidence have suggested that the use of lymph node dissection should be applied

only to subsets of women.

First, the conduct of axillary lymph node dissection has been associated with additional short and intermediate term morbidity for women. Most notably, patients who receive axillary node dissection and/or radiation for breast cancer are at risk for the development of lymphedema, and other arm morbidities such as pain, paresthesias, weakness and impaired shoulder function. Regardless of the type of mastectomy, women who had undergone axillary dissection had significantly more arm problems (24%-64%) than those without axillary dissection (0%-33%).[24] The reported incidence of lymphedema following breast cancer therapy varies widely, Kissin reports a lymphedema rate of 25% overall and a rate of 38% for those patients receiving axillary node dissection and radiation therapy.[25]

With the awareness of this additional morbidity the routine use of axillary lymph node for all women has been questioned. In fact, for the subset of women with in situ disease, it has been recommended that axillary lymph node dissection should be avoided because women with axillary lymph node dissection suffer worse outcomes as a result of arm morbidity.[26] Snipes has found that among women receiving breast conserving surgery, lymph node dissection was performed on 15% of women with in situ tumors.[Error! Bookmark not defined.]

Second, it has become apparent that for many women, particularly older women, treatments will not change depending upon histologic nodal status. The NSABP B-20 trial demonstrated that chemotherapy and tamoxifen provided improved outcomes (i.e., disease free survival) for all breast cancer women with no particular subsets being apparent who would not benefit from these treatments. Accordingly, this study challenged the basis for applying axillary lymph node dissection to all women with a new diagnosis of breast cancer. In fact, a major conclusion of this trial was that axillary staging was not an absolute requirement for medical decisions regarding adjuvant therapy, although knowledge of axillary lymph node status and its effect on prognosis might help some patients to come to a more informed decision regarding the need for systemic therapy.[27] Haffty[28] has additionally demonstrated no benefit to outcomes for subsets of women with axillary lymph node dissection. Accordingly, several groups have advocated informing women who are not likely to benefit from axillary node dissection of outcomes with as compared to without axillary node dissection so that women will be informed, in advance of the surgery, of the extent and expected morbidity of the surgery.[Error! Bookmark not defined.,29,30] Haffty noted that the vast majority (95%) of Medicare women presenting with a new diagnosis of nonpalpable breast cancer had node-negative disease.[Error! Bookmark not defined.] It is expected that with increasing use of mammography that the high percentage of patients with histologically lymph node negative disease will increase. For example, at Yale the proportion of women with negative nodes after conservative treatment and axillary lymph node dissection increased from 70% in 1989 to 82% between 1992 and 1995. Even for the subset of Medicare women with node positive disease, the likelihood that nodal status would change therapy is even lower.[Error! Bookmark not defined.] This is especially true as more evidence mounts suggesting women, especially post menopausal women, have improved outcomes with adjuvant therapy regardless of nodal status. This is true for the use of both tamoxifen and also for the use of chemotherapy.[Error! Bookmark not defined.]

Domain 3: Patient Choice of Treatment

Outcomes following surgery for early stage breast cancer vary as a function of patient choice as well as a function of type of surgery. Choice in decision-making for breast cancer therapy has been shown to be associated with increased physical and functional well-being at one year,[31] decreased anxiety and depression at three months,[32,33] decreased anxiety and depression at three year follow-up,[34] and higher life satisfaction at three months.[35] Patients not offered a choice of therapy were found to have higher levels of anxiety and depression preoperatively and

for up to two months post-operatively in comparison with patients offered a choice of therapy.[Error! Bookmark not defined.]

Substantial research has documented the value of choice and information for patients in general and for breast cancer patients in particular.[Error! Bookmark not defined.,36] Despite this, some evidence has shown that the preference for an active or a collaborative role in treatment decision-making declines with age. The elderly are more likely to choose a passive or non-participatory role in treatment decision-making.[37,38] There is not, however, a linear relationship between the perceived need for information about therapy options and the desired participation in decision-making. More patients want to have information about diagnosis, therapeutic options, and side effects (90-92%) than choose participation in the therapeutic decision (25-69%).[Error! Bookmark not defined.,39]

When given a choice, between 35-87% of women elect breast conserving surgery over mastectomy.[Error! Bookmark not defined.,40-41] When compared with younger women, more older women have tended to choose mastectomy,[Error! Bookmark not defined.,42] although a recent study found that 87% of women 70 years of age and older chose breast conserving surgery.[43]

Domain 4: Radiotherapy Treatments

As noted above in Domain 2, the NSABP studied breast conserving surgery with as compared to without the use of radiotherapy. After 12 years of follow-up, no difference was found in overall survival, disease free survival, or survival free of disease at distant sites between women with mastectomy, with lumpectomy with radiotherapy and lumpectomy without radiotherapy.[44] Recurrence rates were higher (35%) for women with lumpectomy without radiation as compared to 10% for women with lumpectomy with radiation. A Swedish trial also found higher recurrence rates of 20% versus 3% for women without as compared to with radiotherapy.[45]

Elderly women undergoing therapy for breast cancer receive radiation therapy at lower rates than do their younger counterparts. Studies have shown that age is an independent predictor of receipt of radiation therapy for breast cancer, even after adjustment for comorbidity.[46,47] Women 80 years and older were 90% less likely to receive radiation therapy than those younger than 70.[48] Frequency of radiation therapy also declines as a function of comorbidity-from 58% for patients with no comorbidities to 28% for patients with 2 or more comorbid conditions (Charlson score).[Error! Bookmark not defined.] Patient compliance with radiation therapy recommendations (completion) has been reported at 94%.[Error! Bookmark not defined.]

Domain 5: Chemotherapy Treatments

During the 1980s it became apparent that a significant reduction in mortality could be gained for women aged 50 years or older who received adjuvant tamoxifen.[49] In 1985, the National Institutes of Health Consensus Conference advocated tamoxifen as the standard treatment of choice for postmenopausal women with estrogen receptor (ER) positive tumors.[50] The extensive overview meta-analysis in Oxford in 1990[51] comprising more clinical trials than ever before indicated that tamoxifen could benefit most patients with primary breast cancer and that there was also a significant survival benefit for patients with negative axillary lymph nodes who received adjuvant combination therapy.[Error! Bookmark not defined.] The magnitude of this survival benefit for chemotherapy appeared to be small, with an absolute odds reduction in mortality of only about 4% at 10 years for patients with negative axillary lymph nodes.

In 1982, the National Surgical Adjuvant Breast and Bowel Project (NSABP) initiated a clinical

trial (B-14) with adjuvant tamoxifen given to patients with lymph node-negative, ER-positive primary breast cancers. Analysis in 1989[52] showed that there was a significant reduction in relapse rates for the women using tamoxifen, although the survival benefit did not reach statistical significance. The investigators concluded that, although the prognosis for these patients on tamoxifen was good, additional benefit might be achieved by the addition of combination chemotherapy.[Error! Bookmark not defined.] Therefore, a new trial, NSABP B-20, was initiated which compared tamoxifen alone with tamoxifen plus CMFor MF (cytoxan, methotrexate, or 5 fluorouracil) chemotherapy in patients with axillary lymph node-negative, ER-positive primary breast cancer. The results from this trial show that the addition of chemotherapy to tamoxifen caused a further improvement in disease-free survival of about 5% and an additional improvement in survival of about 3%.[Error! Bookmark not defined.] These results were strikingly similar to the results from the 1990 overview[53] which indirectly compared tamoxifen alone with tamoxifen plus polychemotherapy. This work showed no easily discernible group (age, menopausal status, and primary tumor size) was identified that did not gain benefit. This beneficial effect of adding chemotherapy to tamoxifen in patients with axillary lymph node-negative primary breast cancer is in keeping with the 1990 overview meta-analysis data[Error! Bookmark not defined.] which indicated that the absolute benefit for adjuvant chemotherapy was similar for patients with lymph node-negative or lymph node-positive breast cancer. This finding is not surprising, since axillary lymph node status has never been shown to predict the efficacy of adjuvant chemotherapy in improving outcomes. There is no biologic basis to suppose that axillary lymph node involvement should indicate chemosensitivity, and there are reasons to suppose that less extensive disease might be more likely to respond to chemotherapy.[Error! Bookmark not defined.]

The principal conclusion from the NSABP B-20 trial[Error! Bookmark not defined.] in conjunction with the data from the overview meta-analysis,[Error! Bookmark not defined.] is that adjuvant chemotherapy will give rise to small but definite reductions in relapse and death in all subgroups of patients categorized according to tumor size, axillary lymph node status, hormone receptor status, age, and menopausal status. No easily identified subgroup of patients are apparent as the sole recipients of the benefit of adjuvant chemotherapy who might be selected for treatment. Accordingly, Fisher, et al recommended that only those patients with noninvasive cancers and, perhaps, those with very small screen-detected cancers should be absolutely excluded from consideration of adjuvant chemotherapy.[Error! Bookmark not defined.]

Although this perspective has not yet disseminated into many practice settings, it is expected that it will within the next few years as more methods for minimizing the toxicities of chemotherapy are applied to the elderly. Slevin et al.[54] noted that most patients with breast cancer would accept severe toxicity from treatment in order to achieve as little as a 1% improvement in survival. Powles[Error! Bookmark not defined.] noted the toxicity from adjuvant chemotherapy is generally mild and seldom life threatening: therefore, a 4% reduction in mortality at 10 years is likely to be considered an attractive option by most patients with axillary lymph node-negative primary breast cancer.

Domain 6: Tamoxifen Treatments

The Early Breast Cancer Trialists' Collaborative Group[Error! Bookmark not defined.] studied with meta-analysis more than 30,000 women randomized between treatment and control for polychemotherapy and hormonal therapy. They concluded that for women over aged 50 and specifically for women over aged 70 that tamoxifen has been extensively tested and produced significant risk reductions. For women 70 or more years the risk reduction in recurrence was 28% and in mortality was 21%. If restricted to trials of at least two or more years risk reductions for women 70 years or more in recurrence was greater at 33% and in mortality was greater at

25%.

After the recognition that post-surgical treatment with tamoxifen improved overall survival among patients with early stage breast cancer, evaluations were initiated to understand the optimal duration of such treatments. The Swedish Breast Cancer Cooperative Group randomized postmenopausal women with early stage breast cancer to a trial of two versus five years of adjuvant tamoxifen therapy during the 1980s. Daily doses were either 20 mg (two centers) or 40 mg (at the remaining three centers). Patients assigned to receive five years of tamoxifen, compared with two years of tamoxifen had statistically significant improvements in event-free survival with a relative hazard of 0.82 (CI 0.71-0.96) and overall survival with a relative hazard of 0.82 (CI 0.69-0.99). These findings translate into an 18% relative reduction in both first events and mortality with the longer treatment. The benefit associated with the longer treatment extended to women regardless of lymph node status, but appeared to be restricted to women whose tumors were estrogen receptor positive.[55] The Oxford meta-analysis of 133 multinational trials showed longer term tamoxifen (at least two years) is significantly more effective than shorter tamoxifen regiments with an odds reduction of 22% (p=.004). This meta-analysis showed that for women over 50 years, tamoxifen produced significant benefits, even among estrogen receptor negative women with a recurrence reduction of 16% (p=.001) and a mortality reduction of 16% (p=.004). Fisher,[56] additionally showed a substantial survival benefit to women aged 50 or greater for women using tamoxifen for five years as compared with a longer period. Disease free survival was improved with longer tamoxifen use (69% versus 57%, p<.0001 with a relative risk of 0.66, 95% CI 0.58-0.74), while distant disease free survival was also improved with longer tamoxifen use (76% versus 67%, p<.0001 with relative risk =0.70, 95% CI 0.61-0.81).

Domain 7: Care Following Initial Surgery/Radiotherapy

Lack of continuity of care is experienced by many breast cancer patients following initial treatment. Research findings suggest that lack of continuity, in turn, results in reduced quality of life. A number of papers reflect expert opinion that coordination and communication among team members helps to assure continuity of care.[57]

Domain 8: Treatment of Morbid and Comorbid Symptoms, Signs, and Conditions

Within this domain we focus on the symptoms, signs, and conditions that are prevalent amongst women with breast cancer since these represents patient concerns that require treatment. We focus on the subset of conditions noted to be associated with improved outcomes if women are treated with better as compared with worse processes. These measures are derived from the oncology, geriatric, and quality of care literature.

The condition of arm morbidity following axillary node dissection and/or radiation for breast cancer represent good examples of prevalent conditions which can benefit from treatment. The arm symptoms may be characterized as the development of lymphedema or other arm morbidities such as pain, paresthesias, weakness and impaired shoulder function. In a study of 223 patients after surgery for non-recurrent breast cancer, Maunsell et al. found incidences of arm morbidity at 3 months as follows: swelling-24%, pain-55%, numbness-58%, weakness-26%, limitation in range of motion-32%, and stiffness-40%.[Error! Bookmark not defined.] At 18 month follow-up, only range of motion and loss of sensation had improved by 10% or more. The reported incidence of lymphedema following breast cancer therapy varies widely, Kissin reports a lymphedema rate of 25% overall and a rate of 38% for those patients receiving axillary node dissection and radiation therapy.[Error! Bookmark not defined.]

Arm problems following breast cancer surgery are related to number of lymph nodes excised, presence of postoperative wound complications, employment status and age.[58] In a study of 381 patients with stage I breast cancer, Liljegren et al. found that only age and number of lymph nodes excised predicted number of arm problems in a multivariate model: relative risk of 0.93 per year of increasing age (95%CI 0.91-0.97) and relative risk of 1.11 per lymph node found (95%CI 1.05-1.18).[Error! Bookmark not defined.] There was a trend toward less frequent arm problems with increasing time since surgery. Similarly, Kiel and Rademacker found that the actuarial probability of edema was predicted by age, number of nodes dissected and number of positive nodes dissected.[59] In one study, both radiation therapy to the breast and to the breast and axillary nodes were found to increase edema over mastectomy alone, by 4%-15% and 30% respectively.[60] However, Liljegren et al. found that radiation therapy to the breast alone did not adversely affect arm symptoms over the first three postoperative years.[Error! Bookmark not defined.]

In a case-control study, 46% of patients with lymphedema reported some degree of functional impairment, whereas control patients without lymphedema reported no functional impairment.[61] Patients with lymphedema had significantly higher scores on the Clinical Interview Scale, a semistructured, standard mental state examination,[Error! Bookmark not defined.] particularly in the areas of anxiety and depression. Patients with lymphedema experienced poorer adjustment to their illness as measured by the Psychological Adjustments to Illness Scale in the areas of vocational, domestic and social environments, sexual relations and psychological distress.[Error! Bookmark not defined.] At one site, 10% of patients in rehabilitation for breast cancer related lymphedema are referred for psychiatric evaluation.[62]

In a study of 223 patients after surgery for non-recurrent breast cancer, Maunsell et al. found the adjusted odds ratio for psychological distress was proportional to the number of arm problems reported at 3 and 18 months, respectively: 1.2/1.9 for 1-2 problems, 2.3/4.4 for 3-4 problems, and 3.1/6.0 for 5-6 problems; p=0.002/0.0002.[Error! Bookmark not defined.]

Pain is often associated with lymphedema (25%) and is correlated with distress, decreased functioning and decreased sexual desire.[Error! Bookmark not defined.] In a qualitative study of patients with lymphedema after breast cancer treatment, subjects reported distress from limited physician knowledge, limited treatment options, anxieties around social and personal relationships, body image, and changes in work- and lifestyles.[63]

Because of the impact of these arm symptoms on function and mood, treatment is often multimodal. For lymphedema treatment may be symptomatic and may consist of elevation of the extremity, compression garments, massage therapy and/or intermittent pneumatic compression pumps.[Error! Bookmark not defined.,64,65] Combination physical therapy consisting of skin care, manual lymphedema treatment, exercises and compression wrapping followed by a maintenance program and psychosocial rehabilitation is the recommended treatment,[66] and has been shown to result in some volume reduction of the affected extremity in 95% of patients, 54% of whom maintain the therapeutic result at 3 years.[67] Refractory cases may require pneumatic compression, drug therapy or surgery.[Error! Bookmark not defined.] An intensive, 4 week, multimodal treatment program-consisting of massage, sequential pneumatic compression and compression bandaging along with patient education in self-management skills-for patients with lymphedema secondary to breast cancer treatment was able to decrease degree of lymphedema and need for physical assistance and increase perceived comfort and strength of the extremity and quality of life.[Error! Bookmark not defined.] Simple compression treatment for lymphedema was equally successful (34% at 2 months, 39% at 6 months) in patients over 65 years as those 65 and under.[68]

CONCLUSION

Early stage breast cancer treatment has been extensively researched, and solid evidence, including much from randomized control trials, supports a number of process-outcome links. Professional organizations around the world have relied on the existing evidence to propose extensive practice guidelines across all major domains of breast cancer care. Some performance measure sets have been proposed. We have described the evidence basis as it currently exists, and we have emphasized evidence pertaining specifically to the elderly. A fully mature performance measurement system with extensive field experience does not yet exist in breast cancer (or, indeed, in most clinical conditions); a very promising breast cancer measurement system is rapidly evolving, due in large part to this impressive body of evidence that has been amassed to date and the ongoing research efforts of many distinguished and dedicated researchers. Extensive field work is now needed to further test proposed measure sets along the important dimensions of validity, reliability, feasibility, efficiency, and utility. Only with extensive testing will we know which measures produce accurate information that all interested parties can confidently use in making critical health and financial decisions.

Table 1: BREAST CANCER LITERATURE SEARCH: SUMMARY OF SEARCHES

TOPIC	Searched by Subjects (su)	Searched by Key Words (kw)	N Citations
I. Adjuvant therapy and:	Breast neoplasms + Combined modality therapy AND:		-
A. Survival	Survival rate		184
B. Recurrence	Recurrence or neoplasm recurrence		254
C. Disease-free survival	Disease-free survival		77
D. Mortality	[Breast neoplasms], mortality		203
E. Quality of life	Quality of life		27
F. Functional status	Activities of daily living or Health status		37
		Function or Functional	
G. Post-menopausal bleeding	Breast neoplasms + Endometrium + Post-menopause		29
	Breast neoplasms + Uterine hemorrhage + Post-menopause		
Adjuvant Therapy Outcomes (Combined)			506
II. Mastectomy and:	Mastectomy AND:		-
A. Survival	Survival rate		169
B. Recurrence	Recurrence or neoplasm recurrence		334
C. Disease-free survival	Disease-free survival		86
D. Mortality	[Breast neoplasms], mortality		186
E. Quality of life	Quality of life		33
F. Functional status	Activities of daily living or Health status		42
		Function or Functional	
G. Pain	Pain		38
		Pain	
H. Arm function	Activities of daily living or lymphedema		50
	Arm		
		Arm	
Mastectomy Outcomes (Combined)			590
III. Breast conserving surgery with radiation therapy and:	Breast neoplasms, radiotherapy or Radiotherapy, adjuvant AND:	Breast conserving or Breast conservation or Lumpectomy	-
A. Survival	Survival		86
B. Recurrence	Recurrence or neoplasm recurrence		133
C. Disease-free survival	Disease-free survival		28
D. Mortality	[Breast neoplasms], mortality		44
E. Quality of life		Quality of life	5
F. Functional status	Activities of daily living or Health status		6
		Function or Functional	
G. Pain	Pain		3
		Pain	
H. Arm function	Activities of daily living or lymphedema		11
	Arm		
BCS with Radiation Outcomes			173

TOPIC	Searched by Subjects (su)	Searched by Key Words (kw)	N Citations
(Combined)			

Table 1 (continued)

TOPIC	Searched by Subjects (su)	Searched by Key Words (kw)	N Citations
IV. Pain	Breast neoplasms + Pain, prevention and control		172
	Breast neoplasms, therapy or Breast neoplasms, surgery +Pain		
V. Arm function	Breast neoplasms + Activities of daily living or lymphedema	Function or functional	66
	Breast neoplasms + Arm		
VI. Patient preference for treatment	Breast neoplasms + Patient participation or decision support techniques or choice behavior	Patient	225
	Breast neoplasms, psychology + Decision making or patient participation		
	Breast neoplasms, therapy	Treatment + Patient + Choice or preference or selection or decision or knowledge or options	
VII. Quality of life	Breast neoplasms + Quality of life		162
VIII. Functional status	Breast neoplasms + Activities of daily living or Health status		96
	Breast neoplasms	Function or Functional	
IX. Master List: All citations			**1523**

Table 2
PUBLISHED BREAST CANCER GUIDELINES

#	GUIDELINES	Domain 1 Recognition, Diagnosis, Severity Assessment, Referral	Domain 2 Initial Surgical Treatment	Domain 3 Patient Choice of Treatment	Domain 4 Radiotherapy Treatment	Domain 5 Chemo-therapy Treatment	Domain 6 Tamoxifen Treatment	Domain 7 Care Following Initial Surgery/ Radiotherapy	Domain 8 Treatment of Mo Comorbid Symp Signs, & Condit
1	Goldhirsch[1] (1998) 6th International Conference on Adjuvant Therapy of Primary Breast Cancer Treatment Recommendations		X	X	X	X	X		
2	Winchester[2] (1998) American College of Radiologists/American College of Surgeons/ College of American Pathologists/Society of Surgical Oncology. Diagnosis and Management of Invasive Breast Carcinoma	X	X	X	X			X	X
3	Winchester[3] (1998) American College of Radiologists/American College of Surgeons/ College of American Pathologists/Society of Surgical Oncology. Diagnosis and Management of Ductal Carcinoma In Situ (DCIS)	X	X	X	X		X	X	X
4	Canadian Medical Association[4] (1998) Clinical Practice Guidelines	X	X	X	X	X	X	X	X
5	ASCO[5] (1998) Practice Guidelines on Use of Tumor Markers in Breast Cancer	X							
6	Consensus Conference Committee[6] (1997) on Classification of Ductal Carcinoma In Situ	X							
7	National Comprehensive Cancer Network[7] (1997) Guidelines	X	X		X	X	X	X	

[1] Goldhirsch A, Glick JH, Gelber RD, Senn H-J. Meeting highlights: International consensus panel on the treatment of primary breast cancer. *J Natl Cancer Inst* 1998;90(21):1601-1608.

[2] Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107.

[3] Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS) of the breast. *CA Cancer J Clin* 1998;48(2):108-128.

[4] Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83.

[5] ASCO. 1997 update of recommendations for the use of tumor markers in breast and colorectal cancer. *J Clin Oncol* 1998;16(2):793-795.

[6] Consensus Conference Committee. Consensus conference on the classification of ductal carcinoma in situ. *Cancer* 1997;80(9):1798-1802.

[7] National Comprehensive Cancer Network (NCCN). Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220.

8	Blum[8] (1997) Texas Oncology P.A. Treatment Guidelines					X	X	X	

* Multiple recommendations of a more technical nature. See article for specific recommendations.

NOTE: If guidelines apply to multiple domains, they are listed in each domain to which they apply.

[8] **Blum JL, Jones SE, Fay JW, Senzer N, Mennel RG. Guidelines for systemic therapy for early stage breast cancer.** ***Breast Cancer Research and Treatment*** **1997;43:259-276.**

Table 2 (continued)

#	GUIDELINES	Domain 1 Recognition, Diagnosis, Severity Assessment, Referral	Domain 2 Initial Surgical Treatment	Domain 3 Patient Choice of Treatment	Domain 4 Radiotherapy Treatment	Domain 5 Chemo-therapy Treatment	Domain 6 Tamoxifen Treatment	Domain 7 Care Following Initial Surgery/ Radiotherapy	Domain 8 Treatment of Mo Comorbid Symp Signs, & Condit
9	NCI[9] (1997) Conference Recommendations on Fine Needle Aspiration (FNA)	X							
10	Blichert-Toft[10] (1997) Practice Guidelines from the European Society of Surgical Oncology (ESSO)	X	X	X	X			X	
11	Sawka[11] (1997) British Columbia Treatment Guidelines on Adjuvant Therapy in Node-Negative Breast Cancer					X	X		
12	McDermott[12] (1997) Irish Society of Surgical Oncology	X	X	X					X
13	Love[13] (1996) Practice Guidelines	X	X	X	X	X	X	X	
14	NHS Executive Initiative[14] (1996) Clinical Practice Guidelines of the Cancer Guidance Group of the Clinical Outcomes Group	X	X	X	X	X	X	X	X
15	Kirshbaum[15] (1996) U.K. Lymphoedema Guidelines		X	X	X				X
16	British Association of Surgical Oncology[16] (1995) Guidelines for Surgeons in the Measurement of Symptomatic Breast Cancer	X	X	X	X	X	X	X	X

[9] National Cancer Institute. The uniform approach to breast fine-needle aspiration biopsy. *Am J Surg* 1997;174:371-385.

[10] Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109.

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[15] Kirshbaum M. The development, implementation and evaluation of guidelines for the management of breast cancer related lymphoedema. *Eur J Cancer Care* 1996;5:246-251.

[16] Breast Surgeons Group of the British Association of Surgical Oncology. Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13.

17	National Health and Medical Research Council (NHMRC)[17] (1995) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer	X	X	X	X	X	X	X	X

NOTE: If guidelines apply to multiple domains, they are listed in each domain to which they apply.

[17] National Health and Medical Research Council (NHMRC). National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Table 2 (continued)

#	GUIDELINES	Domain 1 Recognition, Diagnosis, Severity Assessment, Referral	Domain 2 Initial Surgical Treatment	Domain 3 Patient Choice of Treatment	Domain 4 Radiotherapy Treatment	Domain 5 Chemo-therapy Treatment	Domain 6 Tamoxifen Treatment	Domain 7 Care Following Initial Surgery/ Radiotherapy	Domain 8 Treatment of Mo Comorbid Symp Signs, & Condit
18	Coates[18] (1995) Australian Consensus Report on the Management of Early Breast Cancer	X	X	X	X	X	X	X	
19	Olivotto[19] (1997) British Columbia Provincial				X	X			
20	Van Dongen[20] (1992) Second EORTC Consensus Meeting on Ductal Carcinoma In Situ	X	X						
21	Bartelink[21] (1991) Consensus Meeting of the EORTC Radiotherapy and Breast Cancer Cooperative Groups and the EUSOMA (European Society of Mastology)	X	X	X	X				
22	NIH[22] (1990) Consensus Development Conference on Early Stage Breast Cancer	X	X	X	X	X	X		X
23	McCarthy and Bore[23] (1991) King's Fund Consensus Conference Guidelines		X	X	X	X	X		

NOTE: If guidelines apply to multiple domains, they are listed in each domain to which they apply.

[18] Coates A. Management of early breast cancer: An Australian consensus report. *Oncology* 1995;52:82-85.

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[23] McCarthy M, Bore J. Treatment of breast cancer in two teaching hospitals: A Comparison with consensus guidelines. *Eur J Cancer* 1991;27(5):579-582.

Table 3
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 1: RECOGNITION AND DIAGNOSIS OF THE BREAST PROBLEM, SEVERITY ASSESSMENT, AND REFERRAL

2. **ACR/ACoS/CAP/SSO Guideline Set #1: Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107.** (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

Stage I and II Invasive Breast Cancer

"Four critical elements in patient selection for breast-conservation treatment are history and physical examination, mammographic evaluation, histologic assessment of the resected breast specimen, and assessment of the patient's needs and expectations."

- "Much of the information needed to determine a patient's suitability for breast-conservation therapy can be obtained from a detailed history and physical examination. Age per se, whether young or old, is not a contraindication to breast conservation. In the elderly, physiologic age and the presence of comorbid conditions should be the primary determinants of local therapy."

Breast History Elements

"Family history: Relatives with breast cancer, including age at diagnosis; bilaterality; and ovarian carcinoma, endometrial carcinoma, or other malignancies
Previous therapeutic irradiation involving the breast region

- Previous collagen vascular disease, including type of documentation of diagnosis
- Presence and location (submammary or subpectoral) of breast implants
- Date of last menstrual period/possibility of pregnancy
- Nipple discharge, including whether spontaneous or induced and color
- Symptoms suggestive of metastasis"

Breast Physical Examination Elements

"Tumor size (measured) and location

- Fixation of tumor to skin
- Ratio of breast size to tumor size
- Evidence of multiple primary tumors
- Axillary node status, including size and mobility
- Supraclavicular node status
- Evidence of locally advanced cancer, including the following:
  Skin ulcerations, satellitosis
  - Peau d'orange
  - Inflammatory carcinoma
  - Fixed axillary nodes
  - Lymphedema of the ipsilateral arm"

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Mammographic Evaluation

"Recent preoperative mammographic evaluation is necessary to determine a patient's eligibility for breast conservation treatment. It should be done with high-quality, dedicated mammographic equipment in a facility certified by the US Food and Drug Administration under the Mammography Quality Standards Act."

- "Recent (usually within 3 months) mammographic evaluation, before biopsy or definitive surgery, plays an important role in establishing the appropriateness of breast-conservation treatment. Mammographic evaluation defines the extent of a patient's disease, the presence or absence of multicentricity, and other factors that might influence the treatment decision and evaluates the contralateral breast. Bilateral mammography is needed for palpable lesions and nonpalpable lesions that can be identified only radiographically. An increasing percentage of carcinomas treated with breast conservation are nonpalpable masses and microcalcifications."
- "The breast tumor should be measured in at least two dimensions on the mammographic views or from the sonogram during ultrasonography, if it is performed. The size of the tumor should be included in the mammographic report. If the tumor is a poorly marginated mass, approximate dimensions can be given from either the mammogram or the sonogram. The skin of the breast in the area of a mass should be evaluated for thickening that might signify tumor involvement."
- "If the mass is associated with microcalcifications, an assessment of the extent of the calcifications within and outside the mass should be made. Dimensions of the area in which calcifications are located should be given. If one or more clusters of microcalcifications are the only markers of the tumor, their location and distribution should be described. For evaluation of masses and microcalcifications, specialized views with positioning adapted to the location of the abnormality may be helpful. Magnification mammography and spot compression are important for characterizing microcalcifications and defining the margins of masses."
- "Ipsilateral multifocality or multicentricity may be present and influence the treatment selection. In every instance, when one abnormality is seen, all areas of each breast should be fully evaluated for the presence of additional disease."

Pathologic Features Influencing Treatment Choice

"Numerous pathologic factors have been assessed for their ability to predict an increased risk of recurrence in the treated breast in patients undergoing conservative surgery and radiation. These factors include histologic type and grade, the presence or absence of tumor necrosis, vascular or lymphatic invasion or an inflammatory infiltrate, the presence of DCIS in association with an invasive ductal carcinoma, margins of resection, and the status of the axillary nodes."

- "Patients with invasive lobular cancers are candidates for conservative surgery and radiation if the tumor is not diffuse in the breast and can be completely excised with negative margins. Under these circumstances, no increased risk of breast recurrence has been seen in patients with invasive lobular carcinomas treated with conservative surgery and radiation."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Pathologic Features Influencing Treatment Choice (continued)

"The risk of breast recurrence in EIC-positive patients can be diminished by the use of wide surgical resections and the achievement of negative margins of resection. A recent report from the Joint Center for Radiation Therapy has confirmed that negative margins of resection diminish the risk of breast recurrence in EIC-positive tumors. Therefore, the presence of an extensive intraductal component is a pathologic indicator that the disease in the breast may be more extensive than is clinically appreciated."

- "Assessment of resection margins in these patients is important in determining treatment options. Patients with EIC-positive tumors in whom the initial margins of resection are positive should undergo reexcision. If the reexcision margins are negative, current information suggests that these patients are appropriate candidates for conservative surgery and radiation. If the reexcision margins remain positive, mastectomy is the preferred treatment."

Pathologic Evaluation

"The excised tissue should be submitted for pathologic examination with appropriate clinical history and specification of anatomic site, including laterality (right or left breast) and quadrant. For wide excisions or segmental breast resections, the surgeon should orient the specimen (e.g., superior, medial, lateral) for the pathologist with sutures or other markers. Gross examination should document the type of surgical specimen (e.g., excisional biopsy, quadrantectomy), the size of the specimen, the measured size of the tumor, and the proximity of the tumor or biopsy site to the margins of excision. The margins of excision are marked with India ink or another suitable technique so that the pathologist can determine whether tumor is present or absent at the margins."

- "The pathologist includes certain basic data in each surgical pathology consultation report because the data are important prognostically or are needed for staging or therapy. The following features should be included in the surgical pathology consultation report for invasive carcinoma:

  How the specimen was received (e.g., number of pieces, fixative, orientation)
  - Laterality and quadrant of the excised tissue and the type of procedure, as specified by the surgeon
  - Measured size of the tumor (in three dimensions if possible)
  - Histologic type and grade
  - Presence or absence of coexistent DCIS or an extensive intraductal component
  - Presence or absence of peritumoral angiolymphatic invasion
  - Presence or absence of gross or microscopic carcinoma (either invasive carcinoma or DCIS) at the margins of excision; if possible, the distance of the tumor or biopsy site from the margin should be stated
  - Lymph node status, including the number of lymph nodes found in the specimen, the number of involved nodes, the size of the largest involved node, and the presence or absence of extension beyond the lymph node capsule"

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Pathologic Evaluation (continued)

"It is important to specify the presence of any special histologic type of invasive breast cancer (e.g., tubular, mucinous, papillary), most of which are considered low grade. All ordinary invasive carcinomas (ductal, not otherwise specified) should be assigned a histologic grade; some authors recommend grading invasive lobular carcinoma as well. If a specific grading system is used, this should be stated in the pathology report. The most commonly used histologic grading system is the Elston modification of the Bloom-Richardson scheme. This system evaluates degree of tubule formation, nuclear grade, and mitotic rate to determine an overall histologic score."

- "The assessment of surgical margins is arguably the most important aspect in the pathologic evaluation of breast tumor excision in patients being considered for breast conservation. Although the definitions of "positive" and "negative" margins vary among institutions, microscopic margin involvement appears to be associated with an increased risk of local recurrence and, usually, indicates a need for further surgery, such as reexcision of the tumor site."
- "Frozen-section preparations of tissue obtained from image-guided needle biopsies of nonpalpable lesions or from mammographically directed biopsies done for microcalcifications are strongly discouraged."
- "The AJCC/UICC (American Joint Committee on Cancer/International Union Against Cancer) TNM classification is recommended for appropriate stage grouping."
- "Determination of estrogen and progesterone receptors is standard for invasive breast carcinomas....The results of ancillary studies (such as steroid receptor analysis, DNA ploidy, proliferative rate, and so forth) are usually reported in an addendum or supplement to the surgical pathology report."

3. ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS). *CA Cancer J Clin* 1998;48(2):108-128. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

DCIS: History and Physical Examination

"An adequate history and physical examination include a complete assessment of the patient's overall health status."

- "Elements of physical examination of the breast:
  "Tumor size (measured) and location, if palpable
  - Nipple discharge, including whether discharge is from duct and whether guaiac positive or negative
  - Nipple appearance, include presence of eczema or discoloration
  - Ratio of breast size to tumor size
  - Axillary node status, including size and mobility

- Presence of supraclavicular nodes
- Appearance of opposite breast and axilla."

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2 (continued):

Guidelines

DCIS: History and Physical Examination (continued)

"Family history: Relatives with breast cancer, including age at diagnosis; bilaterality; and ovarian carcinoma, endometrial carcinoma, or other malignancies
Previous therapeutic irradiation involving the breast region
- Previous collagen vascular disease, including type of documentation of diagnosis
- Presence and location (submammary or subpectoral) of breast implants
- Date of last menstrual period/possibility of pregnancy
- Nipple discharge, including whether spontaneous or induced and color
- Symptoms suggestive of metastasis"

DCIS: Mammography Evaluation

"Recent mammographic evaluation (usually within 3 months) before biopsy or definitive surgery is needed to establish the appropriateness of breast-conservation treatment by defining the extent of the patient's disease. Because the contralateral breast should be evaluated, bilateral mammography is required."
- "In addition to routine mediolateral oblique and craniocaudal views, magnification views and any other special views that may be required should be obtained in an attempt to identify areas of calcified tumor that otherwise might not be apparent. The entire breast should be carefully examined to determine if areas of tumor are present elsewhere in it, which would influence a decision about breast-conserving treatment."

DCIS: Image-directed Biopsy

"Because DCIS most commonly presents as microcalcifications, image-directed procedures are necessary for diagnosis and treatment."

Stereotactic Core-Needle Biopsy

"Stereotactic core-needle biopsy of the breast-- performed by qualified radiologists, surgeons, or other physicians—can be the initial approach for sampling suspicious nonpalpable mammographic abnormalities. Ultrasound-guided biopsy is useful for nonpalpable masses but usually cannot be relied upon for biopsy of microcalcifications."
- "If any one or a combination of these adverse factors exists, image-directed open surgical biopsy is the preferred approach."
- Adverse factors:
  breasts too small
  - inadequate thickness of the breast
  - abnormalities just under the skin
  - widely separated calcifications
  - microcalcifications not tightly clustered or sensitivity or resolution of the stereotactic imaging system hampered so that individual microcalcifications are not well visualized

- uncooperative patient

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2 (continued):

Guidelines

Stereotatic Core-Needle Biopsy (continued)

"For lesions amenable to stereotactic breast biopsy, multiple cores should be obtained, and the specimen should be radiographed to confirm an adequate sampling of the microcalcifications. Leaving some microcalcifications at the site is desirable because if DCIS is diagnosed, they can accurately image-direct the surgeon to definitive excision. If all microcalcifications or the entire mass has been removed, a marker can be left at the biopsy site so that the area can be localized."

Guided Wire Open Biopsy

"Nonpalpable, mammographically evident lesions that are excised surgically should be localized presurgically with a guide, such as a guide wire. Any suspicious lesion detected by mammography requires presurgical localization to ensure accurate removal of the abnormal area and to avoid excess sacrifice of breast tissue. The localization method can be needle-hook wire, dye injection, or a combination of both. Localization should be precise and may require positioning of more than one wire."

- "Labeled craniocaudal and lateral films that show the hook wire should be sent to the operating room for the surgeon's orientation. The current diagnostic films may be of additional value to the surgeon."
- "The surgeon should assess the exact location by triangulation (based on the position, depth of penetration, and angle of the wire) and place the incision closest to the tip of the wire to achieve the best cosmetic result...Tunneling should be avoided, and the skin incision should be made as close to the lesion as possible. The incision should be long enough to permit the removal of the specimen in one piece. Removal of the lesion in numerous fragments should be avoided because doing so precludes margin assessment and size determination."
- "Curvilinear skin incisions are preferable. Periareolar incisions are not appropriate for lesions in the periphery of the breast. The procedure can be done readily with the patient under local anesthesia with or without intravenous sedation."
- "Meticulous hemostasis is critically important. Hematoma formation produces changes that are difficult to interpret by physical examination. In addition, the evolving scar from a hematoma may make interpretation of mammography difficult. These changes may be long lasting and lead to unnecessary biopsy because of the difficulty in evaluation. A better cosmetic result can be achieved by allowing the biopsy cavity to fill with serum, although reapproximation of the biopsy cavity may be appropriate under some circumstances. Drains in the breast should be avoided. "
- "Skin incisions should be closed with a subcuticular technique."
- "The specimen should be radiographed intraoperatively to determine that the mammographic lesion has been excised and to direct pathologic analysis to the site in question in the removed tissue. Magnification and compression of the specimen increase the resolution of the radiograph."
- "The specimen film should be correlated with a preoperative mammogram and interpreted without delay. Absence of the mammographic abnormality on the specimen

radiograph usually indicates that it has not been removed. If the diagnosis is DCIS, extension of calcification (or mass) to the margin of the specimen suggests that a residual tumor might be present in the breast and that further resection along that margin may be indicated."

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2 (continued):

Guidelines

Guided Wire Open Biopsy (continued)

"A postoperative mammogram should be obtained to document complete removal of the mammographic abnormality. It can be done as soon as the patient can tolerate compression. Magnification views may be helpful. Margin status and the postoperative mammogram are complementary means of assessing the completeness of excision. If re-excision is done, another postexcision mammogram should be obtained to reassess the tumorectomy site."

Tissue Handling

"The excised tissue should be submitted for pathology examination with appropriate clinical history and anatomic site specifications, including laterality (right or left breast) and quadrant. For wide excisions or segmental breast resections, the surgeon should orient the specimen (e.g., superior, medial, lateral) for the pathologist with sutures or other markers. The specimen radiograph should be available for the pathologist to review while examining the specimen."

- "The pathologist's gross examination should document the type of surgical specimen when this information is provided (e.g., excisional biopsy, quadrantectomy), the size of the specimen, and the proximity of the tumor (if visible) or biopsy site to the margins of excision."
- "The presence or absence of tumor at the margins of excision is determined by marking the margins with India ink or using another suitable technique. The entire mammographic lesion, and as much of the remaining specimen as practical, should be submitted for histologic examination. Additionally, the margins of the specimen must be thoroughly evaluated, particularly those closest to the lesion."
- "Frozen-section examination of image-guided needle biopsies of nonpalpable lesions or mammographically directed biopsy done for microcalcifications is strongly discouraged. Distinguishing between atypical ductal hyperplasia and DCIS may be impossible in frozen-section preparations, and small foci of microinvasion may be lost or rendered uninterpretable by freezing artifact.

  Frozen sections should be prepared only when enough tissue is present that the final diagnosis will not be compromised (i.e., grossly visible tumors larger than 1.0 cm) and when the information is needed for immediate therapeutic decisions."

Pathologic Features Influencing Treatment Choice

"Although a single classification system for DCIS has not yet been uniformly accepted, the pathologist should clearly report the nuclear grade of the lesion and the presence or absence of necrosis. If a specific grading system for DCIS is used, this should be stated in the pathology report. The report also should include the architectural patterns present because they may have clinical relevance (e.g., the micropapillary pattern may be more prone to involvement of multiple quadrants, independent of nuclear grade)."

- "Although precise measurement may not be possible, the pathologist may be able to estimate the extent of DCIS, and this information should be included in the pathology report."

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2 (continued):

Guidelines

Pathologic Features Influencing Treatment Choice (continued)

"Several methods for estimating the extent (size) of DCIS have been suggested, including (1) directly measuring the size of the lesion if it is confined to a single slide; (2) determining the size after submitting the entire specimen for microscopic examination in sequence and in sections of uniform thickness (2 to 3 mm); (3) estimating the percentage of breast tissue involved by DCIS in relation to the total specimen; and (4) reporting the total number of slides examined and the number with DCIS."

"The pathologist should clearly specify in the pathology report whether DCIS is transected at the surgical margin, and if not, how close the lesion is to the nearest margin."

- "Determinations of estrogen and progesterone receptors, DNA content (ploidy), S-phase, and oncogene amplification are not necessary for noninvasive breast carcinomas."

Pathology Report

"Certain pathologic features should be included in the surgical pathology consultation report because they help determine the most appropriate therapy. These features include the following:

1. How the specimen was received (e.g., number of pieces, fixative, orientation)
2. The laterality and quadrant of the excised tissue and the type of procedure, as specified by the surgeon
3. Size of the specimen in three dimensions
4. Whether the entire specimen was submitted for histologic examination
5. The histologic features of DCIS (e.g., nuclear grade, necrosis, architectural pattern)
6. An estimate of the extent (size) of DCIS (if possible)
7. The location of microcalcifications (e.g., in DCIS, in benign breast tissue, or both)
8. The presence or absence of DCIS at the margins of excision. If possible, the distance of the lesion or biopsy site from the margin should be stated."

4. CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83. (Canadian Medical Association.)

Guidelines

Investigation of Lesions Detected by Mammography

- "Management decisions require close communication between the woman and her physicians. Throughout, a clinician in charge should be identified who will coordinate and transmit all decisions. Management will depend on the estimated level of risk."
- "When an abnormality is detected on screening mammography, clinical evaluation and thorough radiologic work-up are needed to determine its significance."

continued...

4. CMA Guideline Set (continued):

Guidelines

Investigation of Lesions Detected by Mammography (continued)

- "Clinical evaluation should include a history and a thorough examination of the breast axilla and supraclavicular areas."
- "In the radiologic work-up, diagnostic mammograms should be obtained with additional views, spot compression and magnification views as appropriate."
- "Current mammograms should be compared with previous mammograms whenever possible."
- "The mammographic report should include a precise description of the abnormal features visualized and an estimate of the level of suspicion of cancer they imply. (The following radiologic classification into 4 categories is suggested: 1 – benign, not due to cancer; 2 – low risk, probability of cancer under 2%; 3 – intermediate risk, probability of cancer 2% to 10%; 4 – high risk, probably of cancer over 10%.)"
- "Whenever there is any doubt in the interpretation of mammograms, the interpretation of 2 experienced readers should be obtained."
- "Ultrasonography can be used to clarify the nature of noncalcified nodular lesions."
- "Category 1 abnormalities require no further investigation."
- "Category 2 abnormalities may be followed up by periodic mammographic and clinical examinations."
- "Follow-up examination of category 2 abnormalities should be carried out at approximately 6 and 12 months. If the abnormality is stable, examination should be repeated annually for 2 to 3 years thereafter."
- "The rationale of follow-up should be explained, and women should be made aware that it is not possible to provide complete assurance that an abnormality is benign."
- "Category 3 abnormalities usually require image-guided fine-needle or core biopsy."
- "Every image-guided biopsy should be accompanied by a full report."
- "Category 4 abnormalities should usually be excised. This may be preceded by image-guided needle biopsy."
- "When surgical biopsy is carried out, the margins of the resected specimen must be free of tumour."
- "The intact pathology specimen should be examined radiographically to confirm that all mammographic abnormalities have been removed."

The Palpable Breast Lump: Information and Recommendations to Assist Decision-Making when a Breast Lump is Detected

- "The work-up should be completed expeditiously and the patient kept fully informed throughout."
- "Investigation of women with a breast lump or suspicious change in breast texture starts with a history, physical examination and usually mammography."
- "The clinical history should establish how long the lump has been noted, whether any change has been observed and whether there is a history of biopsy or breast cancer. Risk factors for breast cancer should be noted, but their presence or absence should not

influence the decision to investigate a lump further."

continued...

4. CMA Guideline Set (continued):

Guidelines

The Palpable Breast Lump: Information and Recommendations to Assist Decision-Making when a Breast Lump is Detected (continued)

- "The physical examination of the breast should aim to identify those features that distinguish malignant from benign lumps."
- "Mammography can often clarify the nature of the lump and detect clinically occult lesions in either breast."
- "Fine-needle aspiration can establish whether the lump is solid or cystic. When a tumour is solid, cells can be obtained for cytologic examination."
- "Ultrasonography is an alternative method to fine-needle aspiration for distinguishing a cyst from a solid tumour."
- "Whenever reasonable doubt remains as to whether a lump is benign or malignant, a biopsy should be carried out."
- "When surgical biopsy is used, the aim is to remove the whole lump in one piece along with a surrounding cuff of normal tissue."
- "Core biopsy, either clinically or image-guided, can usually establish or exclude malignancy, thus reducing the need for surgical biopsy."
- "Thermography and light scanning are not recommended diagnostic procedures. The value of magnetic resonance imaging is still under investigation. It is not a routine diagnostic procedure at this time."
- "The choice of procedure should take into account the experience of the diagnostician and availability of the technology in question."
- "Even when malignancy is not found, it may be prudent, in some cases, to arrange follow-up surveillance."

The Management of Ductal Carcinoma In Situ (DCIS)

- "The first step in the diagnosis of DCIS, after history-taking and clinical examination, is a complete mammographic work-up."
- "Once DCIS is suspected, either image-guided core biopsy or open surgical biopsy must be carried out."

5. **ASCO Guideline Set: 1997 update of recommendations for the use of tumor markers in breast and colorectal cancer. *J Clin Oncol* 1998;16(2):793-795.** (American Society of Clinical Oncology)

Guidelines

- "Estrogen and progesterone receptors are recommended to be measured on every primary breast cancer, and may be measured on metastatic lesions if the results would influence treatment planning."
- "In both premenopausal and postmenopausal patients, steroid hormone receptor status may be used to identify patients most likely to benefit from endocrine forms of adjuvant therapy and therapy for recurrent or metastatic disease."
- "Estrogen and progesterone receptors are relatively weak predictors of long-term relapse and breast cancer related mortality rates, and are not recommended to be used alone to assign a patient to prognostic groupings."

6. **Consensus Conference Committee Guideline Set : Consensus conference on the classification of ductal carcinoma in situ. *Cancer* 1997;80(9):1798-1802.** (Sponsored by the Breast Health Institute, Fashion Group International, Philadelphia and Jefferson Medical College and Thomas Jefferson University Hospital.)

Guidelines

- The following features should be documented in a pathology report that confirms the presence of DCIS: 1) nuclear grade; 2) necrosi; 3) polarization; 4) architectural pattern(s).
- The following information should be documented in the pathology report:
  - "Margins (distance from any margin to the *nearest* focus of DCIS; focal or diffuse involvement of margins)"
  - "Size (extent and distribution of DCIS)"
  - "Microcalcifications associated with DCIS and calcification outside of the are of DCIS"
  - "Correlation of the tissue specimen with specimen x-ray and mammographic findings."

7. **NCCN Guideline Set: Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220.** (National Comprehensive Cancer Network)

Guidelines

Noninvasive Breast Cancer: LCIS (stage 0, T is N0 M0) or DCIS (stage 0, T is N0 M0)

- Bilateral mammography
- Pathology review

continued...

7. NCCN Guideline Set (continued):

Guidelines

Invasive Breast Cancer (stages I or II)

- Work-up should include "CBC, platelets, liver function tests, chest x-ray, bilateral mammography, ultrasound as necessary, pathology review, tumor ER/PR and s-phase determination, bone scan (only if localized symptoms or elevated alkaline phosphatase)"

9. NCI Conference Guideline Set: The uniform approach to breast fine-needle aspiration biopsy. ***Am J Surg*** **1997;174:371-385.** (National Cancer Institute sponsored conference.)

Guidelines

- Detailed recommendations regarding breast fine-needle aspiration biopsy are given.

10. ESSO Guideline Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. ***Eur J Surg Oncol*** **1997;23:101-109.** (European Society of Surgical Oncology.)

Guidelines

- "The triple assessment method is the basic principle of investigation of the palpable breast lump. The procedure requires: (i) physical examination by an experienced surgeon; (ii) high quality mammography and ultrasonograph; if indicated and (iii) fine needle aspiration cytology (FNAC) or core needle histology."
- "When uncertainty exists concerning one or more of the three modalities in triple assessment or the test result is inconsistent, the investigation is inconclusive. When the trip test is inconclusive, open biopsy is indicated."

12. Irish Society of Surgical Oncology Guideline Set: McDermott EW. Irish guidelines for surgeons in the management of breast cancer. ***Ir Med J*** **1997;90(1):6-8.**

Guidelines

- "In assessing a patient with a breast lump a careful history is taken and a clinical examination performed."
- "If a discrete lump is found fine needle aspiration is performed. If the aspirate contains non-blood stained fluid and the lump disappears, the fluid need not be sent for cytology and no further action is needed. If the aspirate is blood stained or the mass does not disappear the aspirate should be sent for cytology."
- "If the breast lump is solid, fine needle aspiration cytology (FNAC) should be performed. A

mammogram should be performed in women over the age of 35 years or if the mass is clinically malignant. There are advantages in performing mammography before FNAC if the mass is suspected to be malignant. Needle aspiration may result in haematoma formation that can interfere with the interpretation of the mammogram."

continued...

12. Irish Society of Surgical Oncology Guideline Set (continued):

Guidelines

- "Mammography is useful in that it further assesses the risk of a breast lump being malignant and screens both breast for nonpalpable lesions. This may have an impact on the type of definitive surgery performed on the breast. A negative mammogram does not exclude malignancy."
- "Core biopsy is an acceptable alternative to FNAC....Incisional or excisional biospy under local or general anaesthesia can be performed if core biopsy is negative or not appropriate."
- "Ideally the diagnosis of breast cancer should be established before definitive treatment is undertaken."
- "All patients should have a chest x-ray and liver function tests."
- "Bone scanning and liver ultrasound may be done on a selective basis."
- "The TNM system for the staging of breast cancer should be used and recorded in patient's notes."
- "The pathological information must include the maximum diameter of the carcinoma in mm, the extent of the disease including the presence of extensive DCIS, involvement of the tumour margins by tumour, sub-types of invasive and in situ cancers, histological grading of the tumour, extent of nodal involvement and the presence or absence of vascular invasion."
- "Pathological reports should include the histological sub-type of DCIS, its extent and margin involvement."

13. Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21. (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

Detection and Confirmation

- If physical exam shows nondominant palpable lump[24] (excluding multiple masses and cysts),
  - -- if premenopausal, $\leq$ 30 years, then check in 6 weeks
    - -- if normal, then stop
    - -- if lesion still present, then $\pm$ ultrasound, FNA/core biopsy
      - -- if benign, then 2 follow-up visits within 18 months
      - -- if abnormal or nondiagnostic or nonconcordant, then mammogram and excisional biopsy or incisional biopsy
        - -- if benign and concordant, then 2 follow-up visits within 18 months
        - -- if cancer, then definitive treatment
  - -- if postmenopausal or premenopausal > 30 years or strong family history, then diagnostic work-up: mammogram and ultrasound
    - -- if normal, then stop

[24] "A nondominant palpable lump refers to a thickening, area of nodularity, or asymmetry."

continued...

13. Love, Parker, et al Guideline Set (continued):

Guidelines

Detection and Confirmation (continued)

-- if abnormal nondiagnostic, then diagnostic biopsy: FNA/core biopsy
-- if not available or patient choice or nondiagnostic or nonconcordant, then excisional biopsy or incisional biopsy
-- if benign and concordant, then 2 follow-up visits within 18 months
-- if cancer, then definitive treatment
-- if cancer, then definitive treatment
-- if benign and concordant, then 2 follow-up visits within 18 months

- If physical exam shows dominant palpable lump,
  -- if premenopausal $\leq$ 30 years, then $\pm$ ultrasound, FNA/core biopsy
  -- if benign, then 2 follow-up visits within 18 months
  -- if abnormal or nondiagnostic or nonconcordant, then mammogram and excisional biopsy or incisional biopsy
  -- if benign or concordant, then 2 follow-up visits within 18 months
  -- if cancer, then definitive treatment
  -- if postmenopausal or premenopausal > 30 years or strong family history, then diagnostic work-up: mammogram and ultrasound and diagnostic biopsy: FNA/core biopsy
  -- if not available or patient choice or nondiagnostic or nonconcordant, then excisional biopsy or incisional biopsy
  -- if benign and concordant, then 2 follow-up visits within 18 months
  -- if cancer, then definitive treatment
  -- if cancer, then definitive treatment
  -- if benign and concordant, then 2 follow-up visits within 18 months
- "A mammographically detected lesion can be demonstrated to be cystic or solid in ultrasound. A simple cyst on ultrasound needs no further workup. An equivocal lesion should be aspirated by a needle to obtain fluid and a pneumocystogram performed."
- "Any noncystic dominant mass should be investigated by biopsy. Biopsy can be performed with a fine needle for cytology or a core yielding tissue for histology. Both techniques are generally accurate and can be done on palpable or mammographically detected lesions. It is important to adhere to the rule of concordance. The mammographic lesion, ultrasound evaluation, and clinical situations must be in concordance with the cytologic or histologic findings. If there is any discrepancy, an open biopsy should be performed. If a diagnosis of cancer is confirmed, on needle biopsy, definitive surgery can be planned without further diagnostic surgery."
- If mammogram shows nonpalpable lesion, then $\pm$ ultrasound
  -- if cystic, simple, then no further treatment
  -- if cystic, complex, then aspiration and pneumocystogram
  -- if solid/calcifications and benign, then stop
  -- if solid/calcifications and nondiagnostic, then repeat mammogram in 6 months
  -- if benign, then no further treatment
  -- if suspicious, then diagnostic biopsy: FNA/core biopsy and follow on
  -- if solid/calcifications and suspicious, then diagnostic biopsy: FNA/core biopsy
  -- if not available or nondiagnostic or nonconcordant or patient choice, then wire localization biopsy

continued...

13. Love, Parker, et al Guideline Set (continued):

Guidelines

Detection and Confirmation (continued)

-- if benign, then 2 follow-up visits within 18 months (include biopsy mammogram within 3 months)
-- if cancer, then definitive treatment (include post-biopsy mammogram)
-- if cancer, then definitive treatment (include post-biopsy mammogram)
-- if benign and concordant, then 2 follow-up visits within 18 months

Laboratory Tests and Diagnostic Procedures

- "Once the tumor tissue is surgically removed, prognostic factors affecting the prognosis and subsequent treatment must be carefully recorded: tumor size, differentiation (tumor grade), estrogen receptor (ER) and progesterone receptor (PR) levels, nuclear grade, extent of intraductal component, margins of resection (negative, close, positive), and, for node-negative tumors, DNA ploidy and S-phase fraction."

14. NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996. (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "There should be minimal delay between the referral from the GP and an outpatient appointment, and between the first consultation and communication of the diagnosis to the patient. The breast unit should have clear and unambiguous arrangements for rapid referral from GPs. Proposals on referral times are given in guidelines published by the British Association of Surgical Oncologists (BASO)."
- "Diagnostic services must be able to provide rapid and accurate information on imaging results and tissue samples. The combination of clinical examination, mammography/ultrasound and fine needle aspiration cytology - known together as triple assessment - should be available for women with suspected breast cancer at a single visit. All facilities and staff needed to carry out the three types of test should be in close proximity to the diagnostic clinic. The results of tests should be given to the patient within five working days. Thus women who do not have breast cancer can be reassured and treated if necessary, while those who do may proceed rapidly to treatment. A breast care nurse should be available for support and counselling."
- "Surgical biopsy is appropriate when triple assessment does not give a definitive result (see BASO guidelines)."
- "After surgery, the pathologist should give detailed reports on excised cancers which include information on tumour type, pathological size, histological grade, oestrogen receptor status, vascular invasion, extent of ductal carcinoma in situ, tumour margins, and lymph node status when appropriate. This information should also be given to the cancer registry."
- "Radiography facilities and imaging should be subject to the same quality assurance criteria

as the NHS Breast Screening Programme."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. ***Eur J Surg Oncol*** **1995;21(Suppl. A):1-13.** (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Initial investigation of breast symptoms should be by clinical examination. If there is any doubt in the GP's mind that the breast is other than entirely normal then an opinion from a breast surgeon should be sought. Symptoms requiring such opinions are:
  - Lump
  - Nipple discharge
  - Nipple eczema
  - Skin or nipple tether"
- "Breast lumps should only be aspirated by GPs when they have acquired experience in the technique and when it is very likely that the lump is a cyst, i.e. when the lump is smooth and when the patient has had a previous cyst aspirated."
- "If after cyst aspiration there is a residual mass then referral to the Breast Surgeon is mandatory."
- "Cyst fluid should not routinely be sent for cystology."
- "Direct access for GP referral for mammography is not recommended. Open access mammography is unnecessary if access to a breast clinic is adequate."
- "There is no evidence that women on Hormone Replacement Therapy require more frequent mammograms than are received through the National Breast Screening Programme."
- "There is no evidence that women who are apparently of ordinary risk of breast cancer under the age of 50 benefit from screening mammography (this also applies to women who are placed onto HRT at this age)."
- "Referral to a family history clinic, for women with family history of breast cancer, provides an opportunity for risk assessment, counseling, possible early detection and the opportunity to take part in prevention studies and other research programmes."
- "Diagnosis should be based on Triple Assessment, which initially is clinical opinion, and may require imaging and cytology or needle histology."
- "Women with significant breast symptoms or signs should be referred to a surgeon within the district with a specific interest and training in breast disease. The surgeon should work within a multi-disciplinary Breast Clinic, which must be properly staffed and equipped."
- "To maintain expertise such a clinic needs to diagnose a minimum of 50 cancers per year. To be cost-effective this figure is 100-150."
- "The Breast Clinic should be structured to produce a rapid and multi-disciplinary assessment of the woman with breast disease. For the convenience of patients, diagnostic tests should be programmed to ensure the minimum number of visits."
- "The majority of patients with no true abnormalities or with a benign lesion, should receive all diagnostic tests at the single visit. Most may then be told that there is no abnormality or that their lesion is likely to be benign, by the end of that appointment."
- "Patients who have newly diagnosed breast cancer may be given their diagnosis at the initial visit but usually require a second attendance, at which the Breast Care Nurse should be present with the Surgeon to help the patient come to terms with the diagnosis and make an informed choice about treatment. Patients should be encouraged to bring a partner or friend with them when the results are being discussed. The needs of patients whose first language is not English may require special attention. Patients should not receive abnormal results by

telephone or letter."

- Specific recommendations regarding radiography, radiology services, and pathology services are given.

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "Breaking bad news is the responsibility of the senior clinician involved, and should not be delegated to junior or less experienced staff. It should not be delayed, nor should it be done during ward rounds. Women should be dressed and fully alert when such discussions are held."
- "If the woman does not speak English well, a qualified and appropriate interpreter is essential."
- "The NHMRC recommends the following approach, adapted from the NSW Cancer Council.
  - Give bad news in a quiet, private place.
  - Encourage a second person to be present if appropriate.
  - Allow enough uninterrupted time in the initial meeting.
  - Assess the woman's understanding.
  - Provide information simply and honestly.
  - Encourage the woman to express her feelings.
  - Respond to her feelings with empathy.
  - Give a broad time frame for the prognosis.
  - Discuss treatment options.
  - Avoid the notion that "nothing can be done".
  - Arrange a time to talk again.
  - Offer assistance to tell others.
  - Provide information about support services.
  - Document information given.
  - Let others such as the GP know the extent of information given and your perception of the woman's understanding."
- "There is still a considerable variation in the way specialists within a field manage breast cancer. To help GPs provide the most appropriate referrals for their patients, breast surgeons, medical oncologists and radiation oncologists should provide GPs with current information about their practices. This information could include:
  - current management protocols;
  - use of patient support services;
  - accreditation status;
  - approximate fees and charges;
  - waiting times;
  - participation in quality assurance programs, including clinical trials, attendance at conferences and clinicopathological meetings."
- "Having selected the specialist, the referral letter should contain all the necessary information to aid in prompt and appropriate management by the specialist. Test results, films and other relevant data from the medical record should be forwarded with the referral letter."

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- "Optimal therapy for breast cancer is a multidisciplinary activity requiring input from the woman and the surgeon, radiation oncologist, medical oncologist, diagnostic radiologist, pathologist, general practitioner, nurses and other health professionals. This may be provided in an integrated treatment centre or be accomplished elsewhere by consultation between professionals.

  There is good evidence that the survival of patients with breast and other cancers is better if they are treated by a specialist who also treats a large number of similar patients, and who has access to the full range of treatment options in a multidisciplinary setting (**level II**). One of the challenges for general practitioners is to match the referral to the woman's preferences without compromising outcome.

  The service model favoured by women is one which:
  - provides continuity of care;
  - uses a team approach;
  - offers psychosocial support;
  - ensures women's access to relevant health professionals from one
  - location;
  - emphasises liaison with community supports such as general practitioners and community nurses (level IV).

  Although surgeons are usually the specialist clinicians of first contact in the management of a woman with early breast cancer, surgery is but one treatment modality. In many cases, adjuvant radiotherapy or systemic therapy is also used, so other specialists should become involved in the planning of definitive treatment."

- "The following diagnostic modalities are currently used in the preoperative assessment of primary breast cancer. All are known to have limitations, so they are usually used in combination. Apart from history and clinical examination, they are:
  - mammography;
  - breast ultrasound;
  - fine-needle aspiration biopsy;
  - core biopsy."
- "All diagnostic modalities have an error rate and it is advisable to use more than one modality to obtain a pre-operative diagnosis. The combination of clinical examination, mammography, ultrasound and fine-needle aspiration cytology provides the highest diagnostic accuracy and the lowest risk of diagnostic error, particularly in women over 35."
- "Pathology reports should contain information on the following:
  - tumour size;
  - type;
  - histological grade;
  - tumour margins;
  - presence or absence of multifocality;
  - the presence or absence of DCIS, both within the tumour and around it

- (EIC);
- the presence or absence of vessel space invasion in the main tumour;

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- examination of all removed axillary nodes (at least six are required to determine the status of the axilla);
- oestrogen receptor status;
- progesterone receptor status."

18. Australian Consensus Report Guideline Set: Coates A. Management of early breast cancer: An Australian consensus report. *Oncology* 1995;52:82-85. (Clinical Oncological Society of Australia, the Australian-New Zealand Breast Cancer Trials Group, the Royal Australasian College of Surgeons Breast Section and the Medical Oncology Group of Australia.)

Guidelines

- If none of the three diagnostic tests (clinical exam, imaging, and tissue diagnosis by fine needle aspiration cytology or core biopsy) "is suspicious for malignancy, then surgical removal should not be necessary as the risk of malignancy is < 1%."
- "If pre-operative tissue diagnosis of malignancy is established, definitive one stage surgery is appropriate."
- "There should be national standardisation of clinical information provided to the pathologist, specimen handling and the pathology report. This should include tumour size, grade, the presence of multifocality and axillary node examination, and where appropriate tumour margins."
- "Frozen section is not an appropriate examination for mammographically detected impalpable lesions."
- "The minimum tumour markers required for breast cancer management are estrogen receptors and progesterone receptors. Standardisation of the measurement of estrogen/progesterone receptor markers by immunocytochemistry, particularly on fixed tissue, is required."
- "In asymptomatic women with clinically lymph node-negative breast cancer, no advantage has been found for a search for distant metastatic disease beyond history, physical examination and mammography."

20. EORTC Consensus Meeting Guideline Set: Van Dongen JA, Holland R, Peterse JL, Fentiman IS, Lagios MD, Millis RR, Recht A. Ductal carcinoma in-situ of the breast; second EORTC consensus meeting. *Eur J Cancer* 1992;28(2/3):626-629. (2nd EORTC DCIS Consensus Meeting.)

Guidelines

- Features which should be described noteworthy in DCIS: tumour size, margin involvement, nuclear features, necrosis, architecture
- "...there was agreement among both pathologists and clinicians that at present the distance

of tumour from inked specimen edges should be quantitatively recorded, rather than employing the subjective terms of "negative" and "close." Also the presence of normal glandular elements between lesion and margin should be recorded."

21. **EORTC/EUSOMA Consensus Guideline Set: Bartelink H, Garavaglia G, Johansson K-A, Mijnheer BJ, Van den Bogaert W, van Tienhoven G, Yarnold J. Quality assurance in conservative treatment of early breast cancer. Report on a consensus meeting of the EORTC radiotherapy and breast cancer cooperative groups and the EUSOMA (European Society of Mastology). *Radiotherapy Oncol* 1991;22:323-326.** (EORTC Radiotherapy and Breast Cancer Cooperative Groups and the European Society of Mastology (EUSOMA.))

Guidelines

- "*Clinical data to be recorded*: tumour location, distance from nipple, volume, adherences. A clinical photograph is advised, prior to any therapy. Examination of axilla and supraclavicular lymph node areas with the recording of palpable nodes, volume and fixation."
- "*Radiological data*: tumour location, microcalcifications, multicentricity, and dimensions."

22. **NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990. *Cancer Research and Treatment* 1992;60:383-393.** (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- "The diagnosis should be established by fine needle aspiration cytology, limited incisional biopsy (particularly for larger lesions), or definitive wide local excision."
- "The pathologist should perform a careful gross examination with documentation of tumor size."
- "The pathology community should adopt a uniform grading system (nuclear grade) and routinely us this discriminant."

Table 4
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 2: INITIAL SURGICAL TREATMENT

1. **International Consensus Panel Guideline Set: Goldhirsch A, Glick JH, Gelber RD, Senn H-J. Meeting highlights: International consensus panel on the treatment of primary breast cancer. *J Natl Cancer Inst* 1998;90(21):1601-1608.** (6th International Conference on Adjuvant Therapy of Primary Breast Cancer.)

Guidelines

- "The principles guiding the surgical management of [DCIS] are the same as those for invasive cancer – localization and total removal of the primary tumor with clear resection margins."
- [In DCIS axillary] "dissection is not indicated."
- "Breast conserving surgery (and planned radiation therapy to the conserved breast) is the treatment of choice for unifocal, invasive breast cancer that can be excised with clear margins."
- "The accurate definition of node-negative status requires that proper surgical dissection (to levels I and II) be performed and a sufficient number of axillary lymph nodes be examined."
- "For routine use, axillary staging should be based on a sufficient number of examined lymph nodes (usually at least 10) to obtain the proper prognostic information."

2. **ACR/ACoS/CAP/SSO Guideline Set #1: Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107.** (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "Although mastectomy continues to be appropriate for some patients, breast conservation has become the preferred method of treatment for many patients. The results of prospective randomized trials and the results of large retrospective nonrandomized studies from single institutions have shown that mastectomy and breast-conservation treatment are equally effective for appropriately selected patients with early-stage breast cancer."
- "Assessment of resection margins in these patients is important in determining treatment options. Patients with EIC-positive tumors in whom the initial margins of resection are positive should undergo reexcision. If the reexcision margins are negative, current information suggests that these patients are appropriate candidates for conservative surgery and radiation. If the reexcision margins remain positive, mastectomy is the preferred treatment."
- "Ideally, negative margins of resection should be achieved before radiation therapy to diminish the risk of a breast cancer recurrence, especially in patients who will not be receiving adjuvant systemic therapy. The ultimate outcome of EIC-negative tumors with focal margin involvement remains to be determined. Presently, reexcision is recommended in patients whose initial margin of resection is unknown or positive."
- "In contrast to DCIS, lobular carcinoma in situ (LCIS, lobular neoplasia) is an incidental histologic finding that is considered a marker of increased risk for subsequent breast cancer

rather than a malignant lesion requiring surgical excision. This increase in risk applies to both breasts and is probably lifelong. The relation between lobular carcinoma in situ and surgical margins is not important."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Absolute Contraindicators to Breast Conservation Treatment

- "Women with two or more primary tumors in separate quadrants of the breast or with diffuse malignant-appearing microcalcifications...."
- "A history of previous therapeutic irradiation to the breast region that, combined with the proposed treatment, would result in an excessively high total radiation dose to a significant volume...."
- "...persistent positive margins after reasonable surgical attempts absolutely contraindicate breast-conservation treatment with radiation."

Relative Contraindications to Breast Conservation Treatment

- "A history of collagen vascular disease...."
- "...patients with scleroderma or active lupus erythematosus...."
- "Patients with multiple gross tumors in the same quadrant and indeterminate calcifications...."
- "...the presence of a large tumor in a small breast in which an adequate resection would result in significant cosmetic alteration."
- "Breast size...."

Nonmitigating Factors to Breast Conservation Treatment

- "...the presence of clinically suspicious and mobile axillary lymph nodes or microscopic tumor involvement in axillary nodes."
- "Tumor location...."
- Rheumatoid arthritis.
- A family history of breast cancer.
- "A high risk of systemic relapse is not a contraindication for breast conservation but is a determinant of the need for adjuvant therapy."

Skin Incision

- "The placement and performance of the skin incision can be critical to the quality of cosmesis. Curvilinear skin incisions following Langer's lines generally achieve the best cosmetic result. However, in the mid-inner aspect of the breast and the lower breast, a radial incision may provide a better result, particularly if skin removal is necessary."
- "The incision should be over or close to the tumor and of adequate size to allow the tumor to be removed in one piece. In the upper inner aspect of the breast, some retraction of the skin may be necessary to avoid an incision that may be visible with clothing. Periareolar incisions are inappropriate for lesions in the periphery of the breast."
- "Excision of a segment of skin is rarely necessary and is undesirable because it may alter the position of the nipple or the inframammary crease. Preservation of the subcutaneous tissue with separate closure improves the cosmetic result. The skin should be closed with a subcuticular technique."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Breast Tissue Management

- "The primary lesion should be excised with a rim of grossly normal tissue, avoiding excessive sacrifice of breast tissue. Tumors in the subareolar area may require excision of the nipple-areolar complex to ensure adequate tumor margins and to avoid devascularization. (Partial areolar excision with careful approximation for small lesions in the immediate subareolar area can provide adequate tissue removal and good cosmesis.) Closure of the breast tissue may reduce the occurrence of a saucer-like defect, but the overall cosmetic result with nipple-areolar sacrifice is less than optimal."
- "The surgeon should approach lesions within the substance of the breast by incising the overlying breast tissue. A superior cosmetic effect is usually achieved when the breast is not reapproximated."
- "Meticulous hemostasis is critically important."
- "Drains in the breast should be avoided."
- "The surgeon must orient the specimen with the use of sutures, clips, multicolored indelible ink, or another suitable technique. The specimen should not be sectioned before it is submitted to the pathologist. Any uncertainty regarding orientation of the specimen should be clarified for the pathologist by the surgeon. In addition, clips outlining the breast defect may aid the planning and execution of radiation therapy and demarcate the tumor bed for future imaging studies."
- "The specimen should be examined for the determination of a grossly clear margin. If a clear margin is not evident, the tumor should be reexcised at that time. Routine frozen-section evaluation of margins is optional and does not guarantee negative margins after a complete examination."

Image-directed Surgery

- "Nonpalpable carcinoma may be diagnosed by image-directed biopsy or needle localization and excision. If a patient has a nonpalpable carcinoma diagnosed by image-guided biopsy, breast-conserving surgery should be conducted with presurgical localization with a guide such as guide wire."
- "Suspicious lesions detected by mammography require presurgical localization to ensure accurate removal of the abnormal area and to avoid excess sacrifice of breast tissue. The method of localization may be needle-hook wire, Evans blue dye injection, or a combination of both. The localization should be precise. Labeled craniocaudal and lateral films that show the hookwire should be sent to the operating room for the surgeon's orientation."
- "The surgeon usually should assess the exact location by triangulation based on the position, depth of penetration, and angle of the wire and place the incision closest to the tip of the wire to achieve the best cosmetic result. Tunneling should be avoided, and the surgeon should attempt to make the skin incision as close to the lesion as possible. The principles of skin incision and breast tissue management that were discussed earlier should apply."
- "Localization titanium clips may be left in the excision cavity to aid in placement of irradiation boost volume and to ensure adequate coverage with tangential fields, especially for lateral

and medial lesions."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Specimen Radiograph

- "A radiograph of the specimen should be obtained, preferably in two dimensions (orthogonal projections). Magnification and compression of the specimen increase the resolution of the radiograph."
- "The specimen film should be correlated with a preoperative mammogram and interpreted without delay. The radiologist's report should indicate whether the mammographic abnormality (mass or calcifications) is seen in the specimen and if it has been removed completely, as far as can be determined. The proximity of the abnormality to the edge of the resected tissue should be noted. The radiologist should communicate these findings to the surgeon in the operating room before the excision site is closed so that additional tissue can be removed if necessary."
- "Subsequent specimens also should be radiographed. Specimen radiography may be useful in confirming removal of masses that are palpable intraoperatively to ensure that they correspond to the mass lesion seen mammographically."

Reexcision of Biopsy Site

- "The surgeon must reexcise the previous biopsy site carefully to ensure negative margins of resection, to avoid excess breast tissue removal, and to achieve good cosmesis. Proper orientation of the original biopsy specimen avoids removal of an already adequate margin. When the site of inadequate margins is not known, a rim of tissue must be removed around the previous biopsy site. A small segment of skin incorporating the biopsy site should be removed, and undermining should be kept to a minimum."
- "For larger biopsy cavities, shaving of each individual margin and marking of the new margin surface with sutures, clips, or ink allow the surgeon to remove residual tumor while preserving a maximum amount of breast tissue. For very small cavities, removal of the entire biopsy site as an en bloc specimen is acceptable."

Axillary Dissection

- "The breast incision and the axillary incision should be separate. A continuous dissection from the breast into the axilla is likely to produce unsightly deformities. The exception may be an axillary tail tumor that can be readily removed through the axillary incision. A transverse incision low in the axilla that stops at the posterior border of the pectoralis major muscle produces an excellent cosmetic result and good exposure. A linear incision posterior and parallel to the edge of the pectoralis major also provides good exposure and a cosmetically acceptable scar."
- "For invasive tumors that are 1 cm or smaller in diameter and tumors of a favorable histologic type (i.e., tubular, mucinous, papillary), removal of level I nodes is adequate. For staging purposes, removal of level I and level II nodes permits an accurate assessment of axillary nodal status. Removal of level III nodes is advised only when encompassing obvious disease is necessary. Sentinel node lymphatic mapping is still considered investigational."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Axillary Dissection (continued)

- "The thoracodorsal and long thoracic nerves should be preserved. The medial pectoral nerve also should be preserved. Preservation of the intercostal brachial nerve is desirable, but it may not be possible if preservation compromises adequate excision of grossly positive or suspicious nodes. Circumferential stripping of the axillary vein is unnecessary and may increase the incidence of edema."
- "Closed suction drainage is advisable."

3. ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS). *CA Cancer J Clin* 1998;48(2):108-128. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

DCIS: Reexcision of Biopsy Site

- "The previous biopsy site must be re-excised carefully to ensure negative margins of resection, avoid excess removal of breast tissue, and achieve good cosmesis. If the presence of microcalcifications is the indication for reexcision, needle localization should be considered. Proper orientation of the original biopsy specimen avoids removal of an already adequate margin. When the site of inadequate margins is not known, a rim of tissue must be removed around the previous biopsy site."

DCIS: Management of the Axilla

- "Axillary dissection is not necessary for the management of most patients with DCIS."
- "Unsuspected invasive or microinvasive carcinoma occurs more frequently in association with extensive DCIS of high nuclear grade. Most of these patients need mastectomy to encompass the disease. Therefore, a low axillary sampling or level I dissection performed when the mastectomy is done avoids a second operative procedure if invasive carcinoma is found in the mastectomy specimen. If a clinically suspicious node is found during surgery, a frozen section should be done, and if the node is positive, a level I and II axillary node dissection should be performed."

DCIS: Selection of Treatment

- "Without mature data from clinical trials, it is the collective responsibility of the surgeon, pathologist, radiation oncologist, and radiologist to integrate all available data so that treatment options and recommendations can be articulated clearly to the patient.

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2:

Guidelines

DCIS: Selection of Treatment (continued)

- "The surgeon must decide, based on imaging studies and the pathology consultation report, whether the patient is a candidate for a breast-conserving approach. If so, local recurrence must be further discussed. Local recurrence with total mastectomy is rare. Local recurrence is observed at a higher rate in patients treated with breast conservation, but the impact of these local recurrences on overall survival is probably small. Finally, patients need to understand the excellent prognosis for this disease with either surgical approach."

DCIS: Treatment Options

Indications for Mastectomy

- "Although many women with DCIS are candidates for breast-conserving treatment with or without irradiation, in some patients mastectomy is clearly indicated. Such patients include women with two or more primary tumors in the breast or with diffuse, malignant-appearing microcalcifications and those with persistent positive margins after reasonable surgical attempts."
- "In addition, for some women the risk:benefit ratio of breast conservation must be carefully assessed, and consideration must be given to mastectomy as a treatment alternative."

Indications for Mastectomy (continued)

- "Neither tumor size nor histologic type of DCIS is an absolute indication for mastectomy. However, a relative indication for mastectomy is the presence of extensive DCIS that can be removed with only a small negative margin. This is particularly true in a patient with a small breast in which an adequate resection would result in a significant cosmetic alteration that is unacceptable to the patient."

Indications for Breast-Conserving Surgery and Radiation Therapy

- "Indications for breast-conserving surgery and radiation therapy include DCIS detected mammographically or by physical examination that is localized (without evidence of gross multicentricity or diffuse malignant calcifications). The extent of DCIS should be less than 4 cm because few data exist to support breast conservation's effectiveness in larger lesions. The difficulty in measuring the size of DCIS makes definitive recommendations difficult."
- "For mammographically detected DCIS presenting as microcalcifications, all malignant calcifications must be removed before radiation is initiated. Negative margins of resection are important to minimize the ipsilateral breast tumor recurrence rate."
- "Certain factors preclude the use of radiation in the treatment of patients with DCIS and are unrelated to the extent of the disease. These include a history of collagen vascular disease (especially scleroderma and lupus erythematosus), previous therapeutic radiation to the breast or chest, and pregnancy. The first two factors are related to the

potential for significant morbidity, and the last is related to radiation exposure to the fetus."

4. CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83. (Canadian Medical Association.)

Guidelines

The Management of Ductal Carcinoma In Situ (DCIS)

- "At surgical excision, the suspect area should be removed in 1 piece and a specimen radiograph obtained. Tissue should not be sent for frozen-section examination or hormone "receptor analysis."
- "BCS requires wide excision in patients with DCIS. It should be followed by mammography of the involved breast if the specimen radiograph does not clearly include all microcalcifications."
- "Axillary surgery, whether as a full or limited procedure, should not usually be performed in women with DCIS."
- "Mastectomy should not be followed by adjuvant local radiotherapy or systemic therapy."
- "Bilateral mastectomy is not normally indicated for patients with unilateral DCIS."

The Choice of Operation for Clinical Stages I and II Breast Cancer

- "Whenever an open biopsy is performed on the basis of even modest suspicion of carcinoma, the procedure should be, in effect, a lumpectomy, using wide local excision of the intact tumour surrounded by a cuff of tumour-free tissue (by palpation and visual inspection)."
- "The following recommendations should be observed to provide optimum clinical and cosmetic results:
  (a) Tumour-involved margins should be revised;
  (b) Separate incisions should be used for removal of the primary tumour and for the axillary dissection except when these coincide anatomically;
  (c) Radial incisions should not be used except when directly medial or lateral to the nipple;
  (d) Drains and approximation sutures should not be used in the breast parenchyma."

Axillary Dissection

- "Omission of axillary dissection may be considered when the risk of axillary metastasis is very low or when knowledge of node status will have no influence on therapy."
- "Removal and pathological examination of axillary lymph nodes should be standard procedure for patients with early, invasive breast cancer."
- "For accurate staging and to reduce the risk of recurrence in the axilla, level 1 and level 2 nodes should be removed."

7. **NCCN Guideline Set: Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220.** (National Comprehensive Cancer Network)

Guidelines

Noninvasive Breast Cancer

- If LCIS, then "observation preferred *or* in special circumstances: bilateral mastectomy ± reconstruction may be considered."
- If DCIS and widespread disease (2 or more quadrants), then "total mastectomy without lymph node dissection ± reconstruction. (Patients found to have invasive or microinvasive disease at total mastectomy or re-excision should managed as stage I or II disease, including lymph node dissection.)"
- If DCIS and margins negative, then "total mastectomy without lymph node dissection ± reconstruction *or* excision + radiotherapy. (Re-resection may be necessary to obtain negative margins. Patients not amenable to margin-free excision should have total mastectomy.) (Patients found to have invasive or microinvasive disease at total mastectomy or re-excision should be managed as stage I or II disease, including lymph node dissection.)"..."Postexcision mammography should document complete tumor excision."
- If DCIS and margins negative and small (<0.5 cm), unicentric, low grade, then "total mastectomy without lymph node dissection ± reconstruction *or* excision + radiotherapy *or* excision alone (category 2). (Re-resection may be necessary to obtain negative margins. Patients not amenable to margin-free excision should have total mastectomy.) (Patients found to have invasive or microinvasive disease at total mastectomy or re-excision should managed as stage I or II disease, including lymph node dissection.)"..."Postexcision mammography should document complete tumor excision."

Invasive Breast Cancer (stages I or II)

- "A number of randomized trials have documented that, for the primary treatment of the majority of stage I and II breast cancers, mastectomy with axillary lymph node dissection or breast-conserving therapy with lumpectomy, axillary dissection, and breast irradiation are medically equivalent treatment options."
- For stage I and II breast cancer, total mastectomy with level I, II axillary dissection with or without reconstruction or lumpectomy level I, II or axillary dissection and radiography (preferred).
- If prior radiotherapy to the breast, involved or unknown margin status following re-excision, multifocal disease requiring 2 or more separate surgical excisions or multicentric disease, connective tissue disease, or maintained pregnancy, then mastectomy preferred.
- If lumpectomy, then "In the absence of definitive data demonstrating superior survival from the performance of axillary lymph node dissection, patients who have particularly favorable tumors, patients for whom the selection of adjuvant systemic therapy is unlikely to be affected, for the elderly, or those with serious comorbid conditions, the performance of axillary lymph node dissection may be considered optional."

10. ESSO Guideline Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons - management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109. (European Society of Surgical Oncology.)

Guidelines

- "A woman with breast cancer should be entitled to attend a Breast Clinic or Unit and offered appropriate definitive surgical treatment. The operation should be performed by surgeons with special expertise in breast cancer treatment. A surgeon trained in plastic surgery of the breast should be a member of the team when breast reconstruction is considered."
- Non-invasive cancer:
  - LCIS: "The choice of treatment rests between surgical biopsy and a watch policy, or bilateral mastectomy. Since the natural history of LCIS is uncertain and the cancers which develop in this situation are not always lobular carcinomas, the current recommendation is to adopt a close surveillance policy on patients of this category."
  - "Axillary dissection is not indicated in non-invasive cancer."
- "A Breast Cancer Unit must have specialist expertise in breast surgery, breast imaging, breast pathology and cytology. Further requirements are access to local oncology services for anti-cancer drugs and quality breast radiotherapy together with the availability of specialist breast care nurses."
- "Formal multi-disciplinary review meetings to consider diagnosis, treatment options and further adjuvant therapy."
- "The surgeons must ensure that the gross margins are identified without incision into the specimen and that the specimen is carefully orientated according to pathologist's requirements."
- "Free specimen margins should be ensured whether mastectomy or breast conservation is performed. Adequacy of excision is assessed by the pathologist and recorded as the shortest distance from the nearest circumferential margin to any tumour-involved area. This distance should preferably be at least 10 mm on the fresh specimen."
- "Histological node status should be obtained on all primary operable invasive tumours. Minimal requirements are four nodes examined (sampling procedure), but preferably 10 nodes are advised."
- "In DCIS a local excision is not appropriate for extensive lesions."

12. Irish Society of Surgical Oncology Guideline Set: McDermott EW. Irish guidelines for surgeons in the management of breast cancer. *Ir Med J* 1997;90(1):6-8.

Guidelines

- "Conservation of the breast without compromising the goals of the breast cancer surgery is the preferred option.... All patients should be considered for breast conserving surgery (BCS)."
- "Not all patients are suitable for BCS. Indications for total mastectomy are multifocal disease, anticipated poor cosmetic result, breast cancer occurring in the 1st or 2nd trimester of pregnancy, patient preference and contraindications to radiotherapy."

continued...

12. Irish Society of Surgical Oncology Guideline Set (continued):

Guidelines

- "Technique of conservative surgery:
  - Curvilinear incision (radial for large mass in lower quadrants)
  - Incision directly over lesion
  - Separate incision for the axillary surgery
  - Thick flaps
  - At least 1 cm gross margin (margins must be histologically clear)
  - Pectoralis fascia removed in deep lesions
  - Haemostasis
  - Metallic clip (titanium) to the tumour bed
  - No drain or deep sutures
  - Subcuticular suture"
- "The use of metallic clips facilitates radiotherapy. The tumour bed can be seen on x-ray films taken during simulation so that a radiation boost can be given to this area if indicated."
- "The histological specimen should be orientated using sutures. The specimen can then be inked by the pathologist and a portion of the tumour sent fresh for receptor analysis. Oestrogen an progesterone receptor status can be measured by ELISA at designated centres. Receptor status can also be estimated by immunohistochemistry on fixed sections."
- "Patients having BCS should have radiotherapy to the residual breast."
- "A level I-III clearance should be performed in patients with positive axillary nodes and in tumours estimated to be greater than 1 cm."
- "Treatment options for DCIS include total mastectomy, wide excision alone."
- "If wide excision is performed [in DCIS] radiotherapy should be added because of the high risk of local recurrence if not given."
- "Indications for mastectomy in DCIS include extensive disease on mammography, clinically palpable lump greater than 2 cm, blood nipple discharge, Paget's disease and involved margins after resection."
- "In patients with DCIS axillary surgery is unnecessary especially if the disease is not extensive within the breast."
- "If the disease [DCIS] is extensive within the breast or if microinvasion is present axillary clearance up to the intercostobrachial nerve should be performed (Low Level I clearance)."
- If high grade comedo DCIS < 0.5 cm, then segmental mastectomy.
- If high grade comedo DCIS 0.5-1.9 cm, then segmental mastectomy and radiotherapy.
- If high grade comedo DCIS $\geq$ 2.0 cm, then total mastectomy.
- "No specific surgical treatment is indicated for LCIS. Close surveillance with breast self-examination, clinical breast examination and annual mammography is indicated."

13. **Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21.** (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

Carcinoma In Situ

- If DCIS $\leq$ 2.5 cm noncomedo, then re-excision $\leq$ 2 times $\pm$ wire localization
  -- if no residual disease, then balanced discussion and radiotherapy or no further treatment
  -- if residual disease and clean/close margins with negative post-biopsy mammogram, then radiotherapy
  -- if residual disease and dirty margins, then mastectomy $\pm$ reconstruction
- If DCIS $\geq$ 2.5 cm noncomedo or $\leq$ 5 cm comedo, then re-excision $\leq$ 2 times $\pm$ wire localization
  -- if clean/close margins with negative post-biopsy mammogram, then radiotherapy
  -- if clean/close margins with negative post-biopsy mammogram leading to dirty margins, then mastectomy $\pm$ reconstruction
- If DCIS > 5 cm, then re-excision $\leq$ 2 times $\pm$ wire localization with same follow through (as for DCIS $\geq$ 2.5 cm noncomedo or $\leq$ 5 cm comedo) or mastectomy $\pm$ reconstruction
- If LCIS, then close follow-up: exams every 6 months and yearly mammograms.

Early Stage Breast Cancer: Stage I and II

- If biopsy shows early breast cancer (clinical stage I and II), then partial mastectomy (re-excision) $\leq$ 2 times or mastectomy $\pm$ reconstruction
  -- if partial mastectomy and clean margins, then radiotherapy
  -- if partial mastectomy and close margins and infiltrating ductal, then radiotherapy or re-excision
    -- if re-excision and clean margins, then radiotherapy
    -- if re-excision and dirty margins, then mastectomy $\pm$ reconstruction
  -- if partial mastectomy and dirty margins, then mastectomy $\pm$ reconstruction

14. **NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996.** (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "The proportion of each type of operation done will reflect local differences in case-mix and women's preferences. Surgeons should have the technical skills to support a full range of choices. Suitable patients should be offered breast conserving surgery. Breast reconstruction should be available at the time of, or after mastectomy, provided either by a plastic surgeon or a breast surgeon trained in the appropriate techniques."
- "Surgical treatment should not be offered or withheld on grounds of age alone."

continued...

14. NHS Guideline Set (continued):

Guidelines

- "Breast surgery, the management of excised specimens, and treatment decisions based on pathology and other prognostic information should follow locally written protocols based on BASO guidelines."
- "The pathologist should confirm that the margins of excised tissue are free of tumour cells. Patients who are found to have positive margins should be offered re-excision or mastectomy."
- "Axillary lymph node status is the single most powerful prognostic indicator for breast cancer. The axilla should normally be staged by sampling at least four nodes or by clearance."
- "Each unit should have a clear policy on management of the axilla which takes account of the importance of prognostic information that may be derived from staging of the axilla and minimises the problem of axillary recurrence."

15. U.K. Lymphoedema Project Guideline Set: Kirshbaum M. The development, implementation and evaluation of guidelines for the management of breast cancer related lymphoedema. *Eur J Cancer Care* 1996;5:246-251.

Guidelines

- For the prevention of lymphoedema: "Axillary surgery should be performed by a specialist breast surgeon."

16. BASO Guideline Set: Guidelines for surgeons in themanagement of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Treatment of the primary tumour must follow written protocols agreed by the Breast Team, e.g. criteria for acceptance or treatment with breast conservation etc."
- "Close communication must be maintained between surgeons and radiotherapist/oncologist to plan primary treatment and facilitate subsequent adjuvant therapy. A care plan for each woman should be drawn. Considerations in framing this must take account of factors predictive of both survival (lymph node status, Nottingham Prognostic Index) and of local or regional recurrence, the age and frailty of the patient, social circumstances and patient preferences. Planning should also allow for the availability of re-constructive surgery for those women who wish for it."
- "Surgical treatment of breast disease should be carried out by surgeons with a special interest and training in breast disease. Breast surgeons should work in Breast Units which must provide the necessary expertise and facilities for a multidisciplinary approach to this common malignancy."
- "Once a decision has been reached, patients should be offered a date for operation, rather

than be placed on a waiting list... It is good practice for the operation date to be within 2 weeks, and the maximum acceptable wait should be 4 weeks, except where treatment is planned to be delayed, e.g. to follow primary cytotoxic treatment."

continued...

16. BASO Guideline Set (continued):

Guidelines

- "Surgeons are reminded that all breast operations should be carried out either by trained breast surgeons or by trainees with sufficient training in breast disease (see Table 4), or by trainees under direct supervision at operation."
- "There is good evidence that a peri-operative search for occult metastases (e.g. bone scan, liver ultrasound) does not yield any useful information in a woman with operable primary breast cancer. These investigations should not be carried out at that stage."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "Breast conserving surgery demands complete local excision (CLE), which by definition includes clear histological margins with a rim of normal breast tissue around the periphery of the primary tumour on all sides. This procedure is suitable for tumours which are unifocal and in which clear margins can be obtained, if necessary by including overlying skin. The incision must be carefully planned, taking into account all the requirements of treatment."
- "A breast-conserving protocol comprises CLE in which clear margins are obtained by any surgical technique (including segmentectomy and quadrantectomy), combined with axillary dissection and followed by adjuvant radiation therapy to the breast. It may require a second operation to achieve clear margins. Completeness of excision is an essential requirement for breast conserving surgery."
- "The omission of axillary dissection should be considered only in the case of small primary tumours (T1a, T1b), particularly tumours which are of histological grade I or of a special histological type such as pure tubular carcinoma. The probability of axillary node involvement is related to tumour size but it should be noted that even in T1b tumours (6-10mm), the probability of lymph node involvement approaches 20% (level III). The omission of axillary dissection is least desirable in premenopausal women, however it is acceptable to omit axillary dissection in DCIS."
- "When the omission of axillary dissection from a breast preserving protocol is considered, the woman should be fully informed of the risk of axillary node metastases being undetected."
- The surgical protocol for a total mastectomy includes complete excision of the breast parenchyma with preservation of the underlying pectoral muscles. In cases where axillary dissection is performed, there is little evidence to show that the addition of radiation treatment to the axilla reduces mortality, but it does increase the risk of arm lymphoedema."
- "Mastectomy is an appropriate treatment for women whose tumours extend widely within the breast, have ill-defined margins which defy CLE, directly involve the nipple or overlying skin, or who do not choose breast conservation. Nipple involvement does not always preclude breast conservation."

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- "Specific situations in which mastectomy may be preferred to breast conserving surgery include:
  - a tumour of such a size relative to the breast that a satisfactory cosmetic result may not be obtained;
  - multifocal disease;
  - the presence of extensive intraductal carcinoma with positive margins;
  - extensive high grade DCIS which can not be excised with clear margins;
  - prior radiation therapy to the breast unless the precise dose is known;
  - previous history of collagen disease, particularly scleroderma;
  - the woman chooses mastectomy in the knowledge that the two treatments are equally effective."
- "The choice of treatment of the axilla should therefore be determined by the size and type of the primary tumour in the breast and by the woman's preference following a detailed explanation of the risk of axillary node metastases."
- "Axillary sampling has no role as a therapeutic procedure in the treatment of primary breast cancer (**level IV**)."
- "Irradiation of the axilla should only be undertaken following its dissection when there is very high risk of local recurrence."
- "Because DCIS is not an invasive cancer, complete local excision alone may control the disease, particularly in the case of small mammographically detected lesions."
- "Where DCIS is more extensive, involving an entire segment or in some cases a quadrant of the breast, total mastectomy should be considered."
- "There is an established view that in DCIS, there is no indication for axillary dissection."
- "Although LCIS may be associated with an invasive carcinoma, and although LCIS is an index of an increase in the risk of developing subsequent breast carcinoma, the detection of LCIS as the sole abnormality in a breast biopsy indicates the need for careful surveillance rather than further surgical intervention."

18. Australian Consensus Report Guideline Set: Coates A. Management of early breast cancer: An Australian consensus report. *Oncology* 1995;52:82-85. (Clinical Oncological Society of Australia, the Australian-New Zealand Breast Cancer Trials Group, the Royal Australasian College of Surgeons Breast Section and the Medical Oncology Group of Australia.)

Guidelines

- "Breast conservation and total mastectomy have been demonstrated in a number of multicentre, randomised clinical trials to produce equivalent survival."
- "Breast conservation, defined as complete tumour excision followed by whole breast irradiation, should be offered as preferred therapy to most women with stage I and II breast cancer."
- "Cosmesis is enhanced if incisions are placed appropriately (including a separate incision for axillary dissection), no sutures are placed in the substance of the breast, and complete

haemostatis is obtained."

continued...

18. Australian Consensus Report Guideline Set (continued):

Guidelines

- "For accurate pathological consultation, orientation of the intact, excised specimen and the avoidance of diathermy on the specimen allow evaluation of margins of excision."
- "Re-excision should be performed if pathological margins of excision are less than several millimetres."
- "Total mastectomy may be preferred to breast conservation if a large tumour relative to the size of the breast precludes an acceptable cosmetic result, if gross multifocal disease is present, if extensive malignant-type diffuse microcalcifications are present on mammography, if prior high dose radiation therapy has been given to the region, or if collagen-vascular disease is present."
- "Dissection of the level I and II lymph nodes in the axilla remains the standard of care for invasive breast cancer."
- "Even if the primary tumour is EIC-positive (more than 25% DCIS in the invasive tumour and DCIS in surrounding ducts), although this represents a more diffuse pattern of neoplasia, if excision of such tumours can be performed with adequate pathological margins beast conservation and radiation therapy are still appropriate."

20. EORTC Consensus Meeting Guideline Set: Van Dongen JA, Holland R, Peterse JL, Fentiman IS, Lagios MD, Millis RR, Recht A. Ductal carcinoma in-situ of the breast; second EORTC consensus meeting. *Eur J Cancer* 1992;28(2/3):626-629. (2nd EORTC DCIS Consensus Meeting.)

Guidelines

- "It is likely that a critical factor in selecting patients for BCT, either with or without radiotherapy, will be the assessment of the distance and quality of tumour with respect to the specimen margins."
- "Mastectomy is the therapy of choice for patients with extensive DCIS, having a cure rate closely approaching 100%."
- Routine modal treatment is unwarranted [in DCIS] and should only be considered for patients with very large DCIS.

21. **EORTC/EUSOMA Consensus Guideline Set: Bartelink H, Garavaglia G, Johansson K-A, Mijnheer BJ, Van den Bogaert W, van Tienhoven G, Yarnold J. Quality assurance in conservative treatment of early breast cancer. Report on a consensus meeting of the EORTC radiotherapy and breast cancer cooperative groups and the EUSOMA (European Society of Mastology).** ***Radiotherapy Oncol*** **1991;22:323-326.** (EORTC Radiotherapy and Breast Cancer Cooperative Groups and the European Society of Mastology (EUSOMA.))

Guidelines

- "It has been widely recognized that early breast cancer can be treated with conservative methods: excision of the tumour and radiotherapy to the breast. Such a procedure is not questioned for tumors up to 3 cm. In larger tumour sizes one has to consider the possibility of obtaining a cosmetically satisfactory result, so the total volume of the breast has to be taken into account."
- "**Incision**: skin crease incisions are preferable. For axillary clearance, separate incisions should be used. It is advised that the tumour should be excised **in one piece**."
- Further detailed recommendations (on biopsy specimen labeling, radiological clips, cavity, and pathology reporting) are given.
- "There is a consensus that the axilla should be cleared in premenopausal patients eligible for adjuvant chemotherapy and in patients with clinical lymph node involvement."

22. **NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990.** ***Cancer Research and Treatment*** **1992;60:383-393.** (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- "Breast conservation treatment is an appropriate method of primary therapy for the majority of women with Stage I and II breast cancer and is preferable because it provides survival equivalent to total mastectomy and axillary dissection while preserving the breast."
- "In the selection of women for breast conservation treatment or mastectomy, certain women are not candidates for breast conservation treatment:
  - Women with multicentric breast malignancies, including those with gross multifocal disease or diffuse microcalcifications detected by mammography.
  - Patients for whom breast conservation treatment would produce an unacceptable cosmetic result. Examples include women whose tumors are large relative to breast size and those with certain collagen vascular diseases."
- "When mastectomy is indicated or selected, breast reconstruction should be considered to improve the cosmetic result."
- "The type and placement of incisions can influence greatly the quality of cosmesis. Accurate incisions with thick flaps, centered over the lesion, are superior to radial incisions, particularly for upper quadrant lesions. Routine excision of overlying skin is unnecessary except for very superficial lesions. Careful hemostasis is essential and drains are rarely necessary. In most instances, suture reapproximation of mammary tissue should be

avoided."

continued...

22. NIH Consensus Development Conference Guideline Set (continued):

Guidelines

- "It is appropriate to excise the primary lesion with a normal tissue margin of approximately 1 centimeter. The intent of this recommendation is to achieve a surgical margin that is grossly and microscopically uninvolved with tumor. To obtain adequate pathological evaluation, it is necessary to mark the specimen for proper orientation and to ink the resection margins. When margins are grossly involved with tumor, further resection is indicated. Available data are inadequate to determine whether focal microscopic involvement of a margin increases the risk of local failure after optimal radiation therapy. Because cosmetic result is related to the amount of tissue excised, unnecessarily wide margins (> 2 cm) should be avoided."
- "Because nodal status is the most important available prognostic factor, a Level I-II axillary dissection should be routine both for staging and for prevention of axillary recurrence. Separate incisions should usually be employed for the primary tumor excision and the axillary dissection to enhance functional and cosmetic results."
- The recommended technique for breast conservation includes local excision of primary tumor with clear margins, level I-II axillary node dissection and breast irradiation @ 4500-5000 cGy with or without a boost.

23. Kings' Fund Consensus Conference Guideline Set: McCarthy M, Bore J. Treatment of breast cancer in two teaching hospitals: A Comparison with consensus guidelines. *Eur J Cancer* 1991;27(5):579-582. (King's Fund Consensus Conference (London) on guidelines for breast cancer treatment.)

Guidelines

- "The King's Fund consensus statement recognized the recent trend towards less radical surgery, and that breast conservation with radiotherapy has rates of recurrence that are comparable with mastectomy alone."
- "...mastectomy was regarded as the treatment of choice in certain cases, e.g., if tumours are multifocal or occupy a large proportion of the breast; and patients may request a mastectomy, which reduces the risk of local recurrence and the need for radiotherapy."
- "...axillary nodes should be sampled at the time of surgery."
- "Gross spread to the axilla would normally be treated with axillary clearance, with radiotherapy reserved for recurrence."

Table 5
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 3: PATIENT CHOICE OF TREATMENT

1. **International Consensus Panel Guideline Set: Goldhirsch A, Glick JH, Gelber RD, Senn H-J. Meeting highlights: International consensus panel on the treatment of primary breast cancer. *J Natl Cancer Inst* 1998;90(21):1601-1608.** (6th International Conference on Adjuvant Therapy of Primary Breast Cancer.)

Guidelines

- "Physicians should elicit the preferences of their patients concerning aversion to side effects and attitudes toward disease recurrence and weigh these preferences against the uncertainty of prognosis and of treatment effectiveness."

2. **ACR/ACoS/CAP/SSO Guideline Set #1: Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107.** (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "The patient and her physician must discuss the benefits and risks of mastectomy compared with those of breast-conservation treatment in her individual case with thoughtful consideration of each. Each woman must evaluate how her choice of treatment is likely to affect her sense of disease control, self-esteem, sexuality, physical functioning, and overall quality of life. The following factors should be considered:
    1. Long-term survival
    2. The possibility and consequences of local recurrence
    3. Psychological adjustment (including the fear of cancer recurrence), cosmetic outcome, sexual adaptation, and functional competence"
- "At the time of the first follow-up examination, and serially thereafter, the physician should evaluate the patient for any treatment-related toxicities. This evaluation should include the following:
    1. Assessment of the overall cosmetic result. A 4-point scoring system is recommended for assessing the cosmetic result (Table 10).
    2. Assessment of complications. Complications should be specified with regard to symptomatology and physical findings. The use of the RTOG/EORTC (Radiation Therapy Oncology Group/European Organization for Research and Treatment of Cancer) Radiation Toxicity Scoring Scheme is recommended for the grading of complications. In addition, the simple measurement of arm circumference at fixed distances above and below the olecranon is recommended for the evaluation and quantification of arm edema.
    3. Patient evaluation of results. The patient's evaluation of treatment outcomes in terms of psychological, functional, and cosmetic consequences should be taken into account in the follow-up process."

3. **ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS).** ***CA Cancer J Clin*** **1998;48(2):108-128.** (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "The surgeon must decide, based on imaging studies and the pathology consultation report, whether the patient is a candidate for a breast-conserving approach. If so, local recurrence must be further discussed. Local recurrence with total mastectomy is rare. Local recurrence is observed at a higher rate in patients treated with breast conservation, but the impact of these local recurrences on overall survival is probably small. Finally, patients need to understand the excellent prognosis for this disease with either surgical approach."

Patient Choice Issues

- "Perhaps the most difficult aspect of patient evaluation is the assessment of the patient's needs and expectations regarding breast preservation. The patient and her physician must discuss the benefits and risks of mastectomy compared with breast-conservation treatment in her individual case, with thoughtful consideration of each."
- "Each woman must evaluate how her choice of treatment is likely to affect her sense of disease control, self-esteem, sexuality, physical functioning, and overall quality of life. Several factors should be considered, including (1) long-term survival; (2) the possibility and consequences of local recurrence; and (3) psychological adjustment (including the fear of cancer recurrence), cosmetic outcome, sexual adaptation, and functional competence."

4. **CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document.** ***Canadian Medical Association Journal*** **1998;158(3 Suppl):S1-S83.** (Canadian Medical Association.)

Guidelines

The Choice of Operation for Clinical Stages I and II Breast Cancer

- "For patients with stage I or II breast cancer, BCS followed by radiotherapy is generally recommended. In the absence of special reasons for selecting mastectomy, the choice between BCS and mastectomy can be made according to the patient's circumstances and personal preferences."
- "Mastectomy should be considered in the presence of any of the following:
  (a) factors that increase risk of local recurrence such as extensive malignant-type calcifications visible on the mammogram, multiple primary tumours or failure to obtain tumour-free margins;
  (b) physical disabilities that preclude lying flat or abducting the arm, preventing the use of radiotherapy;
  (c) absolute contraindications for radiotherapy such as pregnancy or previous irradiation of the breast or relative contraindications such as systemic lupus erythematosus or scleroderma;

(d) large tumour size in proportion to breast size;
(e) the patient's clear preference for mastectomy."

continued...

4. CMA Guideline Set (continued):

Guidelines

The Choice of Operation for Clinical Stages I and II Breast Cancer (continued)

- "The following factors are not contraindications for BCS: the presence of a centrally located tumour mass, axillary lymph-node involvement or the presence of breast implants."
- "Before deciding between BCS and mastectomy, the physician must make a full and balanced presentation to the patient concerning the pros and cons of these procedures."

The Management of Ductal Carcinoma In Situ (DCIS)

- "Treatment options for DCIS are mastectomy, wide-excision BCS plus radiotherapy or BCS alone. Treatment should aim to achieve a high degree of local control with the first treatment plan."
- "Final decisions on treatment should not be made until the pathological findings have been reviewed and the specimen radiograph compared with the mammogram."
- "Mastectomy is indicated when lesions are so large or diffuse that they cannot be completely removed without causing unacceptable cosmesis or when there is persistent involvement of the margins, especially with high-grade malignant lesions."
- "Subcutaneous mastectomy should not be used to treat DCIS."
- "BCS should normally be followed by radiotherapy. However, omission of radiotherapy may be considered when lesions are small and are low grade, and when pathological assessment shows clear margins."
- "BCS should be accepted by patients only after they have received a careful explanation of the need for radiotherapy, its side effects and the associated logistic requirements."

Axillary Dissection

- "Patients should be made fully aware of the frequency and severity of the potential complications of axillary dissection."

Breast Radiotherapy After Breast-Conserving Surgery

- "Women who undergo BCS should be advised to have postoperative breast irradiation."
- "Contraindications to breast irradiation include pregnancy, previous breast irradiation (including mantle radiation for Hodgkin's disease) and inability to lie flat or to abduct the arm. Scleroderma and systemic lupus erythematosus constitute relative contraindications."
- "When choices are being made between different treatment options, patients must be made aware of the acute and late complications that can result from radiotherapy."

10. ESSO Guideline Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109. (European Society of Surgical Oncology.)

Guidelines

- Invasive breast cancer:
  - "The general therapeutic strategy and the surgical options in particular should be discussed with the patient."
  - "When informing patients, the surgeon should make sure that basic surgical requirements are observed. Patient preference is most important when planning primary surgical treatment."
  - "A Breast Clinic should be able to offer a choice between several different methods of surgical management of invasive breast cancer. Expert advice is mandatory in order to ensure that the advantages and disadvantages of different forms of treatment are presented in a professional and balanced way and that eligibility criteria are complied with."
  - "The patient should be fully informed and given adequate time before a decision is reached."
  - "Such dialogue may involve more than one meeting and should involve a specialist breast care nurse counsellor where possible."
  - "The surgical options should comply with accepted surgical procedures and be considered equivalent with regard to outcome. The surgical options are:
    (1) Breast-conserving surgery including axillary dissection with subsequent radiotherapy.
    (2) Total mastectomy with *en bloc* axillary dissection.
    (3) Total mastectomy with *en bloc* axillary dissection followed by immediate or delayed reconstruction."

12. Irish Society of Surgical Oncology Guideline Set: McDermott EW. Irish guidelines for surgeons in the management of breast cancer. *Ir Med J* 1997;90(1):6-8.

Guidelines

- "Following diagnosis the patient must be given adequate time, information and support in order to make a fully informed decision about their treatment. This should include discussion with the surgeon, in liaison with a breast care nurse, of appropriate treatment options."
- "Treatment options [DCIS] should be discussed with the patient. Patients who opt for BCS must be aware of the risk of local recurrence and be willing to comply with frequent follow up."

13. Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21. (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

- If DCIS $\leq$ 2.5 cm noncomedo, then re-excision $\leq$ 2 times $\pm$ wire localization
  -- if no residual disease, then balanced discussion and radiotherapy or no further treatment
- "The management of the patient with LCIS varies from no treatment after biopsy with careful follow-up to bilateral prophylactic mastectomies. The choice of treatment depends on the patient's ability to tolerate risk and her desire to preserve her breast."
- If biopsy shows early breast cancer (clinical stage I and II), then partial mastectomy (re-excision) $\leq$ 2 times or mastectomy $\pm$ reconstruction
- If node-negative patient with adequate level I/II axillary dissection and premenopausal and 1.1-3 cm and ER+, then balanced discussion of chemotherapy or tamoxifen $\leq$ 5 years
- If node-negative patient with adequate level I/II axillary dissection and postmenopausal and > 1 cm and ER+/-, then balanced discussion on no treatment, tamoxifen $\leq$ 5 years, or chemotherapy
- If node-positive patient, premenopausal and 1-10 nodes, then chemotherapy and balanced discussion of no tamoxifen or tamoxifen $\leq$ 5 years
- If node-positive patient, premenopausal and $\geq$ 10 nodes, then dose intensification with stem cells, CAF 6 cycles, and balanced discussion of no tamoxifen or tamoxifen $\leq$ 5 years
- If node-positive patient, postmenopausal and ER+, then balanced discussion of tamoxifen $\leq$ 5 years or chemotherapy with or without tamoxifen $\leq$ 5 years
- If node-positive patient, postmenopausal and ER-, then balanced discussion of tamoxifen $\leq$ 5 years or chemotherapy with or without tamoxifen $\leq$ 5 years or nothing

14. NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996. (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "At every stage, patients should be offered clear, objective, full and prompt information in both verbal and written form. Each patient should receive information relevant to her case about the disease, diagnostic procedures, treatment options and effectiveness. The amount and timing of information should take each patient's preferences into account. When there is a genuine choice between treatments, the information given must be sufficiently clear and detailed to allow the woman to make a decision based on evidence of differences in outcome. For example, women for whom alternative surgical procedures are possible should be told about differing probabilities of local recurrence and the lack of significance of local recurrence in terms of survival, the effects of radiotherapy, possible adverse effects of treatment and, as far as possible, given a realistic assessment of their predicted outcome. They should be offered well-produced information leaflets which are both accurate and comprehensible, and guidance from a member of the breast care team when required."

continued...

14. NHS Guideline Set (continued):

Guidelines

- "Patient records should include a checklist to show what information has been provided and a copy should be given to the patient."
- "Providers must be sensitive to potential problems with communication. Members of the breast care team – particularly direct clinical care – should have special training in communication and counselling skills.... They need to be aware that patients often find it difficult to take in information given during the consultation, especially just after receiving their diagnosis. Patients should be given adequate time to reflect before being expected to make any decisions about treatment."
- "There should be agreed procedures and protocols for breaking bad news at key transition points in the disease. Guidelines for giving the cancer diagnosis are available."
- "The role of breast care nurse... is especially important in facilitating continuing communication. The unit should ensure that there is a named person with whom each patient can communicate at any time. Patients should have the name and contact number for a particular nurse, and should, whenever possible, see and speak to the same nurse. The GP and the primary care team should be given the name of this nurse. Patients should have access via the nurse to specialists in the team if they become concerned about possible recurrence."
- "There should be a system for dealing with complaints by patients. These should be taken seriously and answered promptly."
- "A range of primary operations should be available. If the cancer is not too large or diffuse, surgical options include mastectomy (removal of the whole breast) and breast conserving surgery (wide local excision or lumpectomy). In such cases, the choice should be made jointly by the surgeon and the patient, who should be fully informed of all the options and their potential risks, benefits and implications for further treatment. Breast reconstruction should be discussed with patients who are to undergo mastectomy."
- "The possible adverse effects and anticipated benefits of axillary sampling or clearance should be discussed with patients."
- "The option of radiotherapy should be discussed with suitable patients before primary surgery, particularly those who are to have breast conserving surgery. Radiotherapy to the axillary area should not normally be given after surgical clearance of the axilla. Patients should be given clear information on the anticipated benefits and potential risks before decisions are made about treatment. Radiotherapy has an important role in the management of the symptoms associated with metastatic disease."
- "There should be adequate facilities such as hospital and hotel beds, and access to radiology and pathology services. An experienced oncology nurse should be available for all patients who require help, information or support."
- "The choice of systemic therapy for individual women should be guided by protocols based on up-to-date research knowledge and agreed by the breast care team. Risks and benefits of different options should be discussed with patients, who should have continuing access to a specialist nurse for support, practical advice and information."

15. U.K. Lymphoedema Project Guideline Set: Kirshbaum M. The development, implementation and evaluation of guidelines for the management of breast cancer related lymphoedema. *Eur J Cancer Care* 1996;5:246-251.

Guidelines

- For the prevention of lymphoedema: "Verbal and written information about the risks, prevention measures and consequences of developing arm swelling should be provided to each patient before or at the time of cancer treatment."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Treatment of the primary tumour must follow written protocols agreed by the Breast Team, e.g. criteria for acceptance or treatment with breast conservation etc."
- "Following diagnosis, women must be given adequate time, information and support in order to make a fully informed decision of their treatment. This should include discussion with the surgeon, in liaison with the breast care nurse, of suitable treatment options. The offered options and the decisions made should be recorded, particularly when a patient is entering a clinical trial."
- "Close communication must be maintained between surgeons and radiotherapist/oncologist to plan primary treatment and facilitate subsequent adjuvant therapy. A care plan for each woman should be drawn. Considerations in framing this must take account of factors predictive of both survival (lymph node status, Nottingham Prognostic Index) and of local or regional recurrence, the age and frailty of the patient, social circumstances and patient preferences. Planning should also allow for the availability of re-constructive surgery for those women who wish for it."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "The choice to proceed with treatment, and the choices of which form of treatment, should be made by the woman after discussion with her doctor and any others she may care to consult. Only if the woman delegates her decision to the doctor is the doctor entitled to decide which form of treatment to pursue. The doctor is not obliged to undertake a form of treatment with which he or she does not agree."
- "The treatment of early breast cancer has two main aims - to cure the disease and to maintain or improve the quality of life. When the steps required to achieve one aim impinge on the chances of achieving the other aim, the choice of which aim to pursue more thoroughly should be made by the woman with cancer."

- "The aim of treatment should be discussed by the woman and her doctor and, if desired, the woman's family. The aim of treatment should be discussed again each time the clinical situation changes."

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- "Whatever information is provided, the need for information does not end with the initial consultation. Women with breast cancer and their families will need further information as they assimilate that given initially, and as the situation changes.

  Doctors and other health professionals should be aware of these changing requirements, and should give women and their families repeated opportunities to ask questions. A question prompt sheet may help - see Appendix D."
- "It is not necessary to make the decision regarding which form of treatment to undertake at the initial consultation. The woman must be allowed time to accumulate and digest information, and to receive support from family and friends. This can help her understand the disease and select the appropriate form of treatment for her (level IV)."
- "While women want to be accurately informed about their disease and treatment options, they want this information to be provided in an atmosphere of reassurance. Positive communication between women and practitioners is important to allow the assimilation of information and to assist in women's psychosocial adjustment (level IV)."
- "The NHMRC says that women are entitled to make their own decisions about treatments or procedures and should be given adequate information on which to base those decisions. It says:
  - information should be provided in a form and manner which helps
  - patients understand the problem and treatment options available, and
  - which is appropriate to the patient's circumstances, personality,
  - expectations, fears, beliefs, values and cultural background;
  - doctors should give advice, but should not coerce;
  - patients should be encouraged to make their own decisions;
  - patients should be frank and honest in giving information about their
  - health, and doctors should encourage them to be so."
- "The provision of information about breast cancer treatment options involves close attention to the following issues:
  - accurate clinical information tailored to the needs of the individual woman;
  - information about the likely impact of treatment on the individual woman's life;
  - a process which allows information to be absorbed;
  - information given in a way which takes account of the woman's language and comprehension skills."
- "Information about breast cancer treatment is sometimes thought to concern only the disease and treatment options. While this information is critical, women also need information about the psychosocial impact of breast cancer and the material and practical resources required to adjust to and cope with the disease. The information women need includes:
  - the causes of breast cancer;
  - the extent of the disease;
  - the proposed approach to investigation and treatment, including information on expected benefits, the process involved, common side effects and material risks, whether the intervention is conventional or experimental and who will undertake the intervention;

- other options for investigation and treatment;

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- the likely consequences of choosing either another form of treatment, or no treatment;
- the degree of uncertainty involved in all facets of the management;
- the time involved;
- the costs involved;
- the effect of cancer on interpersonal and sexual relationships;
- typical emotional reactions;
- any significant long terms effects - be they physical, mental, emotional, social, sexual or anything else - that may occur;
- appearance after surgery;
- special clothing that may be required;
- how to obtain special items such as wigs and prostheses;
- entitlements to benefits and services, such as subsidies for travel or prostheses (**level IV**)."

- "This information does not need to be provided at the first consultation. Women need time to reflect on opinions, to ask more questions and to consult with the family, friends and advisers. Some of the information can be provided in written form - the state and territory cancer councils are good sources of such material and information. "
- "Doctors should also provide their patients with a management plan and a follow-up plan."
- "Information should be withheld in limited circumstances only. These are:
  - if the doctor judges on reasonable grounds that the woman's physical or mental health might be harmed seriously by the information;
  - if the woman expressly directs the doctor to make the decisions and does not want the offered information. Even in this case, the doctor should give the woman basic information about her illness and the proposed intervention."
- "If the woman is not fluent in English, it is important to use a qualified and appropriate interpreter, rather than a family or staff member.
- "It is important to ensure that the interpreter is prepared to interpret conversation concerning the woman's prospects for survival, and is not restricted from doing so by cultural norms or constraints."
- "When confronted with a diagnosis of cancer, and with technical jargon, and with an often confusing health system, many people do not remember all that was discussed at a consultation. To help, doctors could:
  - provide information in a staged way;
  - repeat key information in slightly different words to help the woman understand and remember it;
  - encourage a support person, whether a relative or friend, to be present for the consultation;
  - provide well-written pamphlets and booklets;
  - tape record the initial consultation and give it to the woman to play later;
  - encourage other members of the health care team to provide information at each stage of investigation and treatment (**level IV**)."

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- "Some of these information objectives may be difficult to achieve within the doctor-patient relationship because of a lack of time, a lack of continuity of care and the emphasis in medical care on the clinical aspects of management. Achieving such objectives should be a shared responsibility of the health care team, possibly including nurse-counsellors. As far as possible, the provision of information and support should be integrated into and promoted through clinical practice. It should not be assumed women will access these independently."
- "All general practitioners and specialists need to assess whether a woman wants to be treated as an equal in decision-making, or whether she prefers to be directed. These preferences should not be assumed. but should be explored with the woman when specialist referral is discussed and then by the specialist to whom she is referred. In either case, full information should be given."
- "Women have the right to obtain a second opinion at any time.... Should any women wish to obtain a second opinion, doctors should cooperate fully in providing all possible information to the other doctor."
- "Doctors have a responsibility to give information about the risks of any treatment, especially those that may influence the woman's decision. Known risks should be disclosed when an adverse outcome is common even though the detriment is slight, or when an adverse outcome is severe even though the occurrence is rare."
- "The woman herself has an important role in the planning of treatment for breast cancer. She should be encouraged to participate in the selection of surgical and subsequent treatment and should be informed fully about the appropriate treatment options. This may involve considerable time in discussion with the surgeon and other therapists but it is an essential step in the preparation for definitive treatment."
- "Psychological morbidity can be significantly reduced by informed discussion prior to treatment (level III)."
- "When the omission of axillary dissection from a breast preserving protocol is considered, the woman should be fully informed of the risk of axillary node metastases being undetected."
- "As indicated elsewhere, the woman should be invited to participate in the selection of treatment whether by surgery alone or by a combination of surgery and radiotherapy. In order to achieve this, she must be fully informed. Many women will accept the clinician's recommendation for treatment, but in all cases the clinician has a responsibility to inform the woman of the existence of treatment choices, and to refer her to specialists in other fields if she desires, particularly if there are difficult decisions to be made."
- "Women should be given the opportunity to consider [breast reconstruction], so they can balance the advantages and disadvantages of reconstruction after mastectomy."

18. **Australian Consensus Report Guideline Set: Coates A. Management of early breast cancer: An Australian consensus report. *Oncology* 1995;52:82-85.** (Clinical Oncological Society of Australia, the Australian-New Zealand Breast Cancer Trials Group, the Royal Australasian College of Surgeons Breast Section and the Medical Oncology Group of Australia.)

Guidelines

- "Decisions regarding the type of local therapy should be made by the patient after full discussion of treatment options and the doctor's recommendation."
- "Breast conservation, defined as complete tumour excision followed by whole breast irradiation, should be offered as preferred therapy to most women with stage I and II breast cancer."
- "Time must be allowed for the woman to access information and to receive support from family and friends. This can assist her to understand her disease and to select the best form of treatment. Doctors and other health professionals should ensure that the woman is aware of sources of additional information and support in the community. Women of non-English speaking backgrounds need special consideration. Counselling by appropriately trained health professionals may provide additional support for patients."

21. **EORTC/EUSOMA Consensus Guideline Set: Bartelink H, Garavaglia G, Johansson K-A, Mijnheer BJ, Van den Bogaert W, van Tienhoven G, Yarnold J. Quality assurance in conservative treatment of early breast cancer. Report on a consensus meeting of the EORTC radiotherapy and breast cancer cooperative groups and the EUSOMA (European Society of Mastology). *Radiotherapy Oncol* 1991;22:323-326.** (EORTC Radiotherapy and Breast Cancer Cooperative Groups and the European Society of Mastology (EUSOMA.))

Guidelines

- "It is strongly advised that before treatment the patient should be seen in a joint meeting by the radiotherapist and surgeon."

22. **NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990. *Cancer Research and Treatment* 1992;60:383-393.** (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- The decision to use adjuvant treatment should follow a thorough discussion with the patient regarding the likely risk of recurrence after adjuvant therapy, the expected reduction in risk with adjuvant therapy, toxicities of therapy, and its impact on quality of life.
- "Women should be educated about treatment choices and clinical trial options in order to make an informed decision in consultation with their physicians."
- A variety of factors have a major influence on a woman's choice of primary therapy. These include logistic and emotional considerations, personal financial issues, and proximity and access to appropriate medical care. A woman's body image and her beliefs and concerns may determine her preference for breast conservation treatment or mastectomy."
- "All node negative patients [not in clinical trials] should be made aware of the benefits and risks or adjuvant systemic therapy. The decision to use adjuvant treatment should follow a thorough discussion with the patient regarding the likely risk of recurrence without adjuvant therapy, the expected reduction in risk with adjuvant therapy, toxicities of therapy and its impact on quality of life. Some degrees of improvement may be so small that they are outweighed by the disadvantages of therapy."

23. **Kings' Fund Consensus Conference Guideline Set: McCarthy M, Bore J. Treatment of breast cancer in two teaching hospitals: A Comparison with consensus guidelines. *Eur J Cancer* 1991;27(5):579-582.** (King's Fund Consensus Conference (London) on guidelines for breast cancer treatment.)

Guidelines

- "...mastectomy was regarded as the treatment of choice in certain cases, e.g., if tumours are multifocal or occupy a large proportion of the breast; and patients may request a mastectomy, which reduces the risk of local recurrence and the need for radiotherapy."

Table 6
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 4: RADIOTHERAPY TREATMENTS

1. **International Consensus Panel Guideline Set: Goldhirsch A, Glick JH, Gelber RD, Senn H-J. Meeting highlights: International consensus panel on the treatment of primary breast cancer. *J Natl Cancer Inst* 1998;90(21):1601-1608.** (5th International Conference on Adjuvant Therapy of Primary Breast Cancer.)

Guidelines

- "Breast conserving surgery (and planned radiation therapy to the conserved breast) is the treatment of choice for unifocal, invasive breast cancer that can be excised with clear margins."
- "Postmastectomy radiation is thus to be considered for patients who, despite proper surgery and adjuvant systemic therapy, are at high risk of local recurrence (a risk of 20% or more; e.g., those presenting with four or more metastatic lymph nodes."
- "Women who undergo breast conservation should be advised to have postoperative breast irradiation, mainly because its omission increases the risk of in-breast recurrence."
- "Local breast irradiation should be started as soon as possible after surgery, usually within 12 weeks, except for patients in whom radiotherapy is preceded by chemotherapy."
- "Patients at increased risk for local-regional recurrence after mastectomy[25] are considered to be candidates for postmastectomy irradiation."

2. **ACR/ACoS/CAP/SSO Guideline Set #1: Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107.** (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "Radiation therapy should be delivered only after evaluation of the mammography findings, the pathology findings, and the surgical procedures performed on the patient."
- "The optimal combination of surgery and irradiation to achieve the dual objectives of local tumor control and preservation of cosmetic appearance varies from patient to patient. The optimal combination is determined by the extent, nature, and location of the tumor; the patient's breast size; and the patient's relative concerns about local recurrence and preservation of cosmetic appearance. Close cooperation between radiation oncologists and medical oncologists also is important because irradiation and adjuvant chemotherapy require integration if both treatment modalities are used."

Elements in the Technique of Irradiation

- "A consensus exists regarding some but not all of the elements in the technique of irradiation. Treatment facilities should conform to American College of Radiology standards

[25] "(defined as at least a 20% cumulative risk of local-regional recurrence in spite of proper surgery and proper adjuvant systemic therapy)"

for radiation oncology facilities. As soon as the patient has healed adequately from the surgical procedure, radiation therapy should begin. Therefore, irradiation usually can begin within 2 to 4 weeks after uncomplicated breast-conserving surgery."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Elements in the Technique of Irradiation (continued)

- "The radiation oncologist should use measures to ensure reproducibility of patient set-up, treatment simulation, treatment planning, and choice of supervoltage equipment to ensure dose homogeneity. High-energy photons (10 MV or more) may be indicated for very large-breasted women or patients who have significant dose inhomogeneity with treatment using lower energy photons."
- "The radiation oncologist can use sophisticated treatment planning that involves three-dimensional rather than two-dimensional dose distributions and accounts for the lower density of lung tissue in the treatment field. (In standard treatment planning, the lung is considered to have unit density.) However, the impact of this recent development on patient outcomes has not been shown. Currently, three-dimensional dose distributions are not considered standard."
- "Each field should be treated on a daily basis, Monday through Friday. A bolus should not be used. To reduce the risk of radiation pneumonitis, not more than 3.0 to 3.5 cm of lung (as projected on the beam radiograph at isocenter) ordinarily should be treated, and a minimum of 1.0 to 1.5 cm of lung is required. For left-sided lesions, efforts should be made to reduce the amount of heart in tangential fields . Whole-breast radiation therapy is delivered using opposed tangential fields to a dose of 4,500 to 5,000 cGy at 180 to 200 cGy per fraction."
- "Controversy exists about the need for delivering an additional boost dose to the primary site. Several considerations may be involved in the decision to use a boost. Histologic studies show that residual cancer after resection of the primary is usually near the primary site, and recurrences after treatment usually are seen at or near the primary site. Boost treatment can be delivered without significant morbidity."
- "Although boost irradiation generally is used, the precise indications for its use are not well defined. Research indicates, however, that a boost should be used in patients with focally positive or close margins of resection."
- "Boost irradiation usually is delivered using electron beam or interstitial implantation. The total dose to the primary tumor site is increased to approximately 6,000 to 6,600 cGy. Selection of the boost dose and volume should be based on knowledge of the surgical procedure and the pathologic findings. In situations in which an electron beam boost and an interstitial implant boost are judged to be equally effective, an electron beam is generally preferred because of considerations of cost, patient convenience, and cosmesis."
- "A boost may not be required for patients who have been treated with more extensive breast resections and have margins of resection that are clearly negative. If the breast boost is omitted in these patients, the only available data indicate that the standard whole-breast radiation therapy dose is 5,000 cGy at 200 cGy per fraction."

Techniques to be Avoided

- "Axillary irradiation is usually unnecessary after a complete axillary dissection (levels I to III). Irradiation of the supraclavicular fossa and the contiguous apical region may be considered if a large number of lymph nodes (four or more) contain tumor. The benefit of radiation in patients with one to three positive nodes is unknown."

- "Overlap between adjacent fields should be avoided."

3. **ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS). *CA Cancer J Clin* 1998;48(2):108-128.** (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "For mammographically detected DCIS presenting as microcalcifications, all malignant calcifications must be removed before radiation is initiated. Negative margins of resection are important to minimize the ipsilateral breast tumor recurrence rate."
- "Certain factors preclude the use of radiation in the treatment of patients with DCIS and are unrelated to the extent of the disease. These include a history of collagen vascular disease (especially scleroderma and lupus erythematosus), previous therapeutic radiation to the breast or chest, and pregnancy. The first two factors are related to the potential for significant morbidity, and the last is related to radiation exposure to the fetus."

Radiation Therapy Considerations

- "Radiation therapy should be delivered only after evaluation of the mammography findings, the pathology findings, and the surgical procedures performed on the patient. The optimal combination of surgery and irradiation to achieve the dual objectives of local tumor control and preservation of cosmetic appearance varies from patient to patient. The optimal combination is determined by the extent, nature, and location of the tumor; the patient's breast size; and the patient's relative concerns about local recurrence and preservation of cosmetic appearance."

Techniques

- "A consensus exists regarding some, but not all, of the elements in the technique of irradiation. As soon as the patient has healed adequately from the surgical procedure, radiation therapy should begin. Therefore, irradiation usually can begin within 2 to 4 weeks after uncomplicated breast-conserving surgery."
- "The radiation oncologist should use measures to ensure reproducibility of patient set-up, treatment simulation, treatment planning, and choice of supervoltage equipment for dose homogeneity. Higher energy photons (10 MV or more) may be indicated for large-breasted women or patients with significant dose inhomogeneity (10% or more) when lower energy photons are used."
- "Each field should be treated on a daily basis, Monday through Friday. A bolus should not be used. To minimize the risk of radiation pneumonitis, not more than 3.0 to 3.5 cm of lung (as projected on the radiograph at isocenter) should be treated, and a minimum of 1.0 to 1.5 cm of lung is required. For left-sided lesions, efforts should be made to minimize the amount of heart in tangential fields. Whole-breast radiation therapy is delivered using opposed tangential fields to a dose of 4,500 to 5,000 cGy at 180 to 200 cGy per fraction."
- "When used, boost irradiation usually is delivered using electron beam or interstitial implantation. The total dose to the primary tumor site is increased to approximately 6,000 to 6,600 cGy."
- "A boost may not be required for patients who have been treated with more extensive

breast resections and have margins of resection that are clearly negative. If the breast boost is omitted in these patients, the only available data indicate that the standard whole-breast radiation therapy dose is 5,000 cGy at 200 cGy per fraction."

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2 (continued):

Techniques to Avoid

- "Nodal irradiation is unnecessary, and excess dose to the heart or lungs through tangential irradiation of the breast must be avoided."

4. CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83. (Canadian Medical Association.)

Guidelines

The Choice of Operation for Clinical Stages I and II Breast Cancer

- "For patients with stage I or II breast cancer, BCS followed by radiotherapy is generally recommended. In the absence of special reasons for selecting mastectomy, the choice between BCS and mastectomy can be made according to the patient's circumstances and personal preferences."

Axillary Dissection

- "Irradiation of the axilla should be carried out with caution after axillary dissection."

The Management of Ductal Carcinoma In Situ (DCIS)

- "BCS should normally be followed by radiotherapy. However, omission of radiotherapy may be considered when lesions are small and are low grade, and when pathological assessment shows clear margins."

Breast Radiotherapy After Breast-Conserving Surgery

- "Omission of radiotherapy after BCS almost always increases the risk of local recurrence."
- "The commonest fractionation schedule used in Canada is 50 Gy in 25 fractions to the whole breast without a boost when excision margins are clear of disease. Alternative schedules that may be used range from 40 Gy in 16 fractions to the whole breast, with or without a boost, to 45 Gy in 25 fractions with a boost of 16 Gy in 8 fractions to the primary site. The role of boost irradiation to the primary site is unclear. Irradiation of the whole breast rather than partial irradiation is recommended."
- "Physicians should adhere to standard treatment regimens to minimize the adverse effects of irradiation."
- "It is recommended that local breast irradiation should be started as soon as possible after surgery and not later than 12 weeks after, except for patients whom radiotherapy is preceded by chemotherapy. However, the optimal interval between BCS and the start of irradiation has not be defined."
- "The optimal sequencing of chemotherapy and irradiation is not clearly defined for patients who are also candidates for chemotherapy. Most centres favour the administration of

chemotherapy before radiotherapy. Selected chemotherapy regimens are sometimes used concurrently with radiotherapy. There is no evidence that this results in better outcome, and there is an increased chance of toxic effects, especially for anthracycline-containing regimens."

7. NCCN Guideline Set: Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220. (National Comprehensive Cancer Network)

Guidelines

Noninvasive Breast Cancer

- If DCIS and margins negative, then "total mastectomy without lymph node dissection ± reconstruction *or* excision + radiotherapy. (Re-resection may be necessary to obtain negative margins. Patients not amenable to margin-free excision should have total mastectomy.) (Patients found to have invasive or microinvasive disease at total mastectomy or re-excision should managed as stage I or II disease, including lymph node dissection.)"... "Postexcision mammography should document complete tumor excision."

Invasive Breast Cancer

- If total mastectomy with level I, II axillary dissection ± reconstruction and ≥ 4 positive nodes, then "consider RT to chest wall and SCV areas."
- If total mastectomy with level I, II axillary dissection ± reconstruction and tumor > 5 cm or margins positive, then "RT to chest wall and SCV areas."
- If total mastectomy with level I, II axillary dissection ± reconstruction and tumor ≤ 5 cm, margins negative, then no RT.

10. ESSO Guideline Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109. (European Society of Surgical Oncology.)

Guidelines

- Invasive breast cancer:
  - "The surgical options should comply with accepted surgical procedures and be considered equivalent with regard to outcome. The surgical options are:
    (1) Breast-conserving surgery including axillary dissection with subsequent radiotherapy.
    (2) Total mastectomy with *en bloc* axillary dissection.
    (3) Total mastectomy with *en bloc* axillary dissection followed by immediate or delayed reconstruction."
  - "The addition of radiotherapy to a surgically cleared axilla should be avoided as the combination of formal surgical dissection and axillary radiotherapy is likely to result in significant arm swelling."
  - "Prophylactic axillary radiotherapy is inappropriate in cases in which adequate numbers of lymph nodes have been examined by the pathologist to conclude that the patient is histologically node-negative (at least four nodes in BASO guidelines). In DBCG protocols radiotherapy is not administered to the axilla in node-positive patients provided at least 10 nodes have been removed and no grossly involved nodes are left in the axillary cavity."

13. **Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21.** (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

- If DCIS $\leq$ 2.5 cm noncomedo, then re-excision $\leq$ 2 times $\pm$ wire localization
  -- if residual disease and clean/close margins with negative post-biopsy mammogram, then radiotherapy
- If DCIS $\geq$ 2.5 cm noncomedo or $\leq$ 5 cm comedo, then re-excision $\leq$ 2 times $\pm$ wire localization
  -- if clean/close margins with negative post-biopsy mammogram, then radiotherapy
- If biopsy shows early breast cancer (clinical stage I and II), then partial mastectomy (re-excision) $\leq$ 2 times or mastectomy $\pm$ reconstruction
  -- if partial mastectomy and clear margins, then radiotherapy
  -- if partial mastectomy and close margins and infiltrating ductal, then radiotherapy or re-excision
    -- if re-excision and clean margins, then radiotherapy
- "Postoperative chest wall RT after modified or total mastectomy should not be administered routinely, but rather should be performed on selective patients who are known to have residual tumor in the operative field or who may be in a high-risk group for locoregional failure (e.g., > 4 positive nodes, T3 or T4 lesion)."
- For early stage breast cancer, "An axillary lymph node dissection should be performed for histologic study because approximately one-third of patients with clinically negative nodes will have histologic involvement and would be candidates for additional treatment."

14. **NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996.** (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "A high quality radiotherapy service should be available for all patients. When one radiotherapy centre serves several cancer units, a clinical oncologist will need to work between sites to assess and advise patients in one location and treat them in another."
- "The option of radiotherapy should be discussed with suitable patients before primary surgery, particularly those who are to have breast conserving surgery. Radiotherapy to the axillary area should not normally be given after surgical clearance of the axilla. Patients should be given clear information on the anticipated benefits and potential risks before decisions are made about treatment. Radiotherapy has an important role in the management of the symptoms associated with metastatic disease."
- "There should be adequate facilities such as hospital and hotel beds, and access to radiology and pathology services. An experienced oncology nurse should be available for all patients who require help, information or support."
- "The radiotherapy service should conform with guidelines in Quality Assurance in

Radiotherapy."

15. U.K. Lymphoedema Project Guideline Set: Kirshbaum M. The development, implementation and evaluation of guidelines for the management of breast cancer related lymphoedema. *Eur J Cancer Care* 1996;5:246-251.

Guidelines

- For the prevention of lymphoedema: "Radiotherapy to the axilla should not be given routinely after axillary clearance."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Close communication must be maintained between surgeons and radiotherapist/oncologist to plan primary treatment and facilitate subsequent adjuvant therapy. A care plan for each woman should be drawn. Considerations in framing this must take account of factors predictive of both survival (lymph node status, Nottingham Prognostic Index) and of local or regional recurrence, the age and frailty of the patient, social circumstances and patient preferences. Planning should also allow for the availability of re-constructive surgery for those women who wish for it."
- "To ensure the appropriate treatment of ductal carcinoma *in-situ* (DCIS): A local excision is not appropriate for extensive lesions. Axillary clearance or radiotherapy to the chest wall or axilla following mastectomy, are contra-indicated. The surgeon is encouraged to know the criteria for entry to the DCIS trial."
- "Radiotherapy and chemotherapy should be carried out by clinical oncologists and medical oncologists who have opted to specialize in breast cancer. They should have special training and interest in breast cancer, be seen as members of the breast care team and treat the patients from the team. They will have expertise in: the use of radiotherapy in breast cancer; the sue of systemic treatments for breast cancer (hormonal or cytotoxic); and the relief of symptoms associated with metastatic breast disease."
- "In the case of early breast cancers treated by wide local excision and post-operative radiotherapy, the time interval between the two should not exceed 4 weeks (except for clinical reasons). The precise time should be determined by clinical assessment and should take into account any time needed for wound healing. Good practice, to secure quick referral, is to hold combined clinics with the surgeon."
- "Radiotherapy techniques should be directed by the radiotherapist who is a member of the Breast Team and who is seeing the majority of breast cancer patients from that unit. Therapeutic radiographers should be appropriately trained, and note taken of the College of Radiographers recommended baseline staffing levels for the safe use of megavoltage machine. Patients should be reviewed by the clinical oncologist regularly throughout their radiation therapy."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "Preoperative consultation with a radiation oncologist should be considered if radiotherapy is thought to be likely."
- "Completeness of excision is an essential requirement for breast conserving surgery."
- "Irradiation of the axilla should only be undertaken following its dissection when there is very high risk of local recurrence."
- "Radiotherapy after lumpectomy significantly reduces the risk of local recurrence."
- "The omission of radiotherapy, even in carefully selected patients, leads to an increased risk of local recurrence."
- "While it is not uncommon clinical practice to omit radiotherapy in highly selected early cases, it has to be emphasised that the decision requires the woman to weigh carefully the benefits of avoiding the side effects and inconvenience of radiotherapy against the risks of local recurrence and the possible need for later mastectomy. A group of women at sufficiently low risk of local recurrence to allow breast conservation without radiotherapy has not been fully defined, although it may be appropriate to omit radiotherapy after full discussion with an individual patient."
- "Radiotherapy after breast conservation involves irradiation of the whole breast with a moderate dose, often followed by a higher dose, or boost, to the site of excision of the primary lesion. The boost allows the delivery of a higher dose to a small volume within which the risk of residual tumour is greatest."

18. Australian Consensus Report Guideline Set: Coates A. Management of early breast cancer: An Australian consensus report. *Oncology* 1995;52:82-85. (Clinical Oncological Society of Australia, the Australian-New Zealand Breast Cancer Trials Group, the Royal Australasian College of Surgeons Breast Section and the Medical Oncology Group of Australia.)

Guidelines

- "The conserved breast should receive whole breast irradiation."
- "Routine irradiation of the dissected axilla or other draining lymph node regions does not improve local control and increases morbidity."
- "Routine postoperative radiotherapy after mastectomy is not recommended."

19. British Columbia Provincial Guideline Set: Olivotto IA, Coldman AJ, Hislop TG, Trevisan CH, Kula J, Goel V, Sawka C. Compliance with practice guidelines for node-negative breast cancer. *J Clin Oncol* 1997;15(1):216-222.

Guidelines

- "Radiotherapy to the breast was recommended for all patients after breast-conserving surgery."

- Radiotherapy to the chest wall was recommended "after mastectomy if the skin or chest wall margins were involved."

21. EORTC/EUSOMA Consensus Guideline Set: Bartelink H, Garavaglia G, Johansson K-A, Mijnheer BJ, Van den Bogaert W, van Tienhoven G, Yarnold J. Quality assurance in conservative treatment of early breast cancer. Report on a consensus meeting of the EORTC radiotherapy and breast cancer cooperative groups and the EUSOMA (European Society of Mastology). *Radiotherapy Oncol* 1991;22:323-326. (EORTC Radiotherapy and Breast Cancer Cooperative Groups and the European Society of Mastology (EUSOMA.))

Guidelines

- Detailed recommendations (both minimum requirements and desirable treatment level) are given for:

  A. External beam treatment of the whole breast tissue.
     -- patient data acquisition and treatment position
     -- target volume, treatment planning, and dose computation
     -- dose prescription and dose homogeneity
     -- beam quality and wedge filters
     -- treatment and verification
  B. Treatment of the tumor bed - boost irradiation
     -- localization of the target volume and prescription dose
     -- brachytherapy
     -- external beams
  C. Quality assurance of equipment and method

22. NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990. *Cancer Research and Treatment* 1992;60:383-393. (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- "Megavoltage radiation therapy to the whole breast to a dose of 4,500 to 5,000 cGy (180 to 200 cGy per fraction) should be routinely used. Boost irradiation has been used in the majority of trials to date. However, the precise indications are not well defined. In the reported trials, the patients with focal microscopic involvement of margins have been treated with boost irradiation or mastectomy. There are no current data to support lesser treatment for these patients. Treatment planning should be done to minimize radiation exposure to lung and heart and to achieve uniform dosage to the treatment volume. Boost irradiation should be delivered by electron beam or implantation to doses of 1,000 to 1,500 cGy. Higher doses produce a greater incidence of cosmetic impairment."
- "If a Level I-II axillary dissection has been performed, axillary node irradiation is not routinely indicated."
- "Although local control can be obtained in some patients with local excision alone, no subgroups have been identified in which radiation therapy can be avoided."

23. Kings' Fund Consensus Conference Guideline Set: McCarthy M, Bore J. Treatment of breast cancer in two teaching hospitals: A Comparison with consensus guidelines. *Eur J Cancer* 1991;27(5):579-582. (King's Fund Consensus Conference (London) on guidelines for breast cancer treatment.)

Guidelines

- "Local recurrence is reduced substantially with radiotherapy, although it does not prolong life. Patients with locally advanced disease may benefit from radiotherapy."

Table 7: PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 5: CHEMOTHERAPY TREATMENTS

1. International Consensus Panel Guideline Set: Goldhirsch A, Glick JH, Gelber RD, Senn H-J. Meeting highlights: International consensus panel on the treatment of primary breast cancer. *J Natl Cancer Inst* 1998;90(21):1601-1608. (6th International Conference on Adjuvant Therapy of Primary Breast Cancer.)

Guidelines

- "Patients who have less than a 10% chance of relapse within 10 years would not be candidates for receiving routine adjuvant systemic therapy."
- For patients with node-negative and node-positive breast cancer...(see Table 3)

Table 3. Adjuvant treatment for patients with node-negative (A) and node-positive (B) breast cancer*

A. Node negative

Patient group	Minimal/low risk	Intermediate risk	High risk
Premenopausal, ER or PgR positive	**None or tamoxifen**	**Tamoxifen ± chemotherapy**† Ovarian ablation‡ GnRH analogue‡	**Chemotherapy + tamoxifen**† Ovarian ablation‡ GnRH analogue‡
Premenopausal, ER or PgR negative	Not applicable	Not applicable	**Chemotherapy**§
Postmenopausal, ER or PgR positive	None **or tamoxifen**	**Tamoxifen ± chemotherapy**†	**Tamoxifen + chemotherapy**†
Postmenopausal, ER or PgR negative	Not applicable	Not applicable	**Chemotherapy**§
Elderly	**None or tamoxifen**	**Tamoxifen** ± chemotherapy	**Tamoxifen** If no ER and PgR expression:

B. Node positive

Patient group	Treatments
Premenopausal, ER or PgR positive	**Chemotherapy + tamoxifen** **Ovarian ablation** (or GnRH analogue) ± tamoxifen‡ Chemotherapy ± ovarian ablation or (GnRH analogue) ± tamoxifen‡
Premenopausal, ER or PgR negative	**Chemotherapy**§
Postmenopausal, ER or PgR positive	**Tamoxifen ± chemotherapy**†
Postmenopausal, ER or PgR negative	**Chemotherapy**§
Elderly	**Tamoxifen** If no ER and PgR expression: **chemotherapy**

* ER = estrogen receptor; PgR = progesterone receptor; GnRH = gonadotropin releasing hormone. Bold entries are treatments accepted for routine use or baseline in clinical trials.

† The addition of chemotherapy is considered an acceptable option based on evidence from clinical trials. Considerations about a low relative risk of relapse, age, toxic effects, socioeconomic implications, and information on patient's preference might justify the use of **tamoxifen alone.**

‡ Indicates treatments still being tested in randomized clinical trials.

§ The addition of tamoxifen following chemotherapy might be considered for patients whose tumors are classified as ER and PgR negative but which exhibit minimal/trace levels of either ER or PgR.

- "For patients considered at high risk of recurrence, the treatment choice follows an algorithm similar to that for node-positive disease, which has a similar prognosis."
- "For high-risk patients, the use of chemotherapy alone was considered to be appropriate when steroid hormone receptors are absent in the primary tumor."
- "For [high-risk] patients with tumors that express estrogen or progesterone receptors, combined chemotherapy and tamoxifen was shown...to be more effective than endocrine therapy alone, irrespective of menopausal status."

- "Patients classified as intermediate risk may be assigned to receive the same chemoendocrine treatment as the high-risk group, although considerations about a lower relative risk of relapse, age, toxicity, socioeconomic implications, and information on patient's preference might justify the use of tamoxifen alone as an endocrine treatment."

continued...

1. International Consensus Panel Guideline Set (continued):

Guidelines

- "For patients who had their tumors classified as estrogen or progesterone receptor-positive, tamoxifen and chemotherapy with an anthracycline-based regimen or with the classical CMF regimen...yield a significant prolongation of disease-free survival as compared with tamoxifen alone."
- "The use of anthracyclines is usually accepted as a standard."

4. CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83. (Canadian Medical Association.)

Guidelines

Adjuvant Systemic Therapy for Women with Node-Negative Breast Cancer

- "Before deciding whether to use adjuvant systemic therapy, the prognosis without adjuvant therapy should be estimated."
- "A patient's risk for recurrence can be categorized as low, intermediate or high on the basis of tumour size, histologic or nuclear grade, estrogen receptor (ER) status, and lymphatic and vascular invasion (LVI)."
- "For each individual, the choice of adjuvant therapy must take into account the potential benefits and possible side effects. These must be fully explained to each patient."
- "Pre- and postmenopausal women who are at low risk of recurrence can be advised not to have systemic treatment."
- "Women at high risk should be advised to have adjuvant systemic therapy. Chemotherapy should be recommended for all premenopausal women (less than 50 years of age) and for postmenopausal women (50 years of age or older) with ER-negative tumours. Tamoxifen should be recommended as first choice for postmenopausal women with ER-positive tumours. For this last group of patients, it is possible that further benefit may be obtained from the addition of chemotherapy to tamoxifen."
- "There are 2 recommended chemotherapy regimens: (1) 6 cycles of cyclophosphamide, methotrexate and 5-fluorouracil (CMF); (2) 4 cycles of Adriamycin and cyclophosphamide (AC)."

Adjuvant Systemic Therapy for Women with Node-Positive Breast Cancer

- "Potential toxic effects should be fully discussed with patients."
- "Women with estrogen receptor-negative tumours who are fit to receive chemotherapy (generally younger than 70 years) should be offered CMF or AC. There is no proof that tamoxifen adds any benefit to chemotherapy. Tamoxifen alone may be of value."
- "Acceptable treatments regimens are those using cyclophosphamide, methotrexate and 5-fluorouracil (CMF) or doxorubicin (Adriamycin) and cyclophosphamide (AC). Cyclophosphamide, epirubicin and 5-fluorouracil (CEF) may be shown in the future to result in better disease-free survival than CMF. Personal choice, quality of life and costs also

influence this choice."

continued...

4. CMA Guideline Set (continued):

Guidelines

Adjuvant Systemic Therapy for Women with Node-Positive Breast Cancer (continued)

- "Women with estrogen receptor-positive tumours may gain a small additional benefit from taking chemotherapy in addition to tamoxifen. This is an option for a motivated, well-informed patient."
- "Systemic adjuvant chemotherapy should begin as soon as possible after the surgical incision is healed."
- "The recommended duration of therapy is at least 6 cycles (6 months) for CMF or CEF, and at least 4 cycles (2 to 3 months) for AC."
- "The recommended CMF regimen consists of 14 days of oral cyclophosphamide with intravenous methotrexate and 5 fluorouracil (5-FU) on days 1 and 8. This is repeated every 28 days for 5 cycles."
- "When possible, patients should receive be the full standard dosage. No recommendations about high-dose chemotherapy can yet be made."

7. NCCN Guideline Set: Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220. (National Comprehensive Cancer Network)

Guidelines

Noninvasive Breast Cancer

- If LCIS, no adjuvant treatment
- If DCIS, no adjuvant treatment

Invasive Breast Cancer: Node Negative

- If stage I, IIA, IIB, node negative and tumor $\leq$ 0.5 cm or microinvasive, then no adjuvant treatment.
- If stage I, IIA, IIB, node negative and histology: tubular collord medullary adenoidcystic and < 1 cm, then no adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: tubular collord medullary adenoidcystic and 1-2.9 cm, then consider adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: tubular collord medullary adenoidcystic and $\geq$ 3 cm, then adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and 0.6-1.0 cm, no unfavorable features, then no adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and 0.6-1.0 cm, unfavorable features ("angiolymphatic invasion, high S-phase, high nuclear grade, high histologic grade"), then consider adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and> 1 cm and hormone-receptor negative, then adjuvant chemotherapy.

continued...

7. NCCN Guideline Set (continued):

Guidelines

Invasive Breast Cancer: Node Negative (continued)

- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and > 1 cm and hormone-receptor positive, age < 50, > 1 up to 3 cm, then "tamoxifen *or* chemo ± tamoxifen."
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and > 1 cm hormone-receptor positive, age < 50, > 3 cm, then "chemo ± tamoxifen."
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and > 1 cm hormone-receptor positive, age ≥ 50, > 3 cm, then "tamoxifen, 20 mg/d x 5 yr (if pathologic stage II, plus chemo is optional)."

Invasive Breast Cancer: Node Positive

- If stage I, IIA, IIB node positive and 1-3 nodes: hormone-receptor negative, then "adjuvant chemotherapy."
- If stage I, IIA, IIB node positive and 1-3 nodes: hormone-receptor positive, age < 50, then "adjuvant chemotherapy ± tamoxifen."
- If stage I, IIA, IIB node positive and 4+ nodes:[26] < age 50, hormone-receptor negative or positive, then "adjuvant chemotherapy (plus tamoxifen optional if hormone-receptor positive."
- If stage I, IIA, IIB node positive and 4+ nodes:Error! Bookmark not defined. ≥ age 50, hormone-receptor negative, then "adjuvant chemotherapy."

8. Texas Oncology P.A. Guideline Set: Blum JL, Jones SE, Fay JW, Senzer N, Mennel RG. Guidelines for systemic therapy for early stage breast cancer. *Breast Cancer Research and Treatment* 1997;43:259-276. (Private practice group of oncologists.)

Guidelines

- For patients with node negative breast cancer, minimal-low risk:[27] "Since the benefits of chemotherapy and hormonal therapy have not been established for this subgroup of patients, observation alone (after surgery alone or surgery followed by radiation therapy) is recommended. For the patient who wants therapy and who is aware of the risks and benefits, tamoxifen 20 mg daily may be reasonable, particularly for patients with ER and/or PR-positive tumors."

continued...

[26] "At every stage, clinical trials are appropriate. If 10 or more positive nodes, participation in clinical trials of high-dose chemotherapy is especially appropriate."

[27] "These are patients with small invasive carcinomas (< 1 cm), or those with T1 lesions, 2 cm or less, with favorable histopathology (mucinous, medullary, tubular, or papillary tumors)."

8. Texas Oncology P.A. Guideline Set (continued):

Guidelines

- For patients with node negative breast cancer, moderate-high risk:[28] "Optimal chemotherapy for node negative patients has not yet been established. The role of Adiamycin containing regimens as opposed to non-Adriamycin containing regimens in moderate-high risk node negative patients is the subject of several large cooperative trials. The data from these trials have not yet matured sufficiently for publication. Until these studies are published, use of standard regimens is recommended. Every effort should be made to avoid reducing dosages or dose intensity regardless of the regimen selected."
- Five options for chemotherapy for node-negative breast cancer (medication, dose, duration) are given.
- "The consensus for node positive patients is that all should receive adjuvant therapy either on a clinical trial or outside of a study."
- "Chemotherapy recommendations: Patients should be encouraged to participate in clinical trials. Every effort should be made to avoid reducing dosages or dose intensity."
- Six standard chemotherapy regimens for node-positive breast cancer (medication, dose, duration) are given.
- For premenopausal women: "Premenopausal node-positive and moderate-high risk node-negative women should receive chemotherapy. For ER-positive and/or PR-positive premenopausal women, tamoxifen can be considered after completion of chemotherapy, particularly if menopause is induced. No tamoxifen is needed in women with hormone receptor-negative tumors." A treatment summary is given.
- For postmenopausal women: "For postmenopausal node positive and moderate-high risk lymph node negative ER-positive and/or PR-positive women, tamoxifen is accepted therapy. However, chemotherapy may have additional benefits in this group of women, particularly if dose intensity is not compromised, and should be strongly considered first, followed by tamoxifen 20 mg daily for 5 years. For postmenopausal ER-negative lymph node positive and moderate-high risk node-negative women, chemotherapy is recommended. These recommendations are in the following tables." A treatment summary is given.
- "Recommended routine laboratory testing prior to the first dose of chemotherapy includes a CBC and an SMA 20. A CBC needs to be checked prior to each dose of chemotherapy. A nadir CBC checked at 10-14 days is recommended, with prophylactic antibiotics (such as ciprofloxacin) considered if the ANC is $\leq$ 1000. If cardiac status is in question, a MUGA scan or echocardiogram to measure resting ejection fraction is recommended before treatment with an anthracycline containing regimen. In the absence of known heart disease, these tests are not necessary."
- "Patients should start chemotherapy before 6 weeks have elapsed from definitive surgery, unless complications from wound healing preclude prompt treatment."

[28] "These are patients with tumors with adverse features. These include receptor negative tumors larger than 1 cm, tumors with an elevated S phase regardless of ploidy or receptor status, or aneuploid tumors with elevated cathespin D, or if flow cytometry data is not available, immunostaining with antibodies directed against the Ki-67 antigen (which correlates with S phase and with mitotic rate). In some circumstances, patients with tumors less than 1 cm with unfavorable characteristics might be included in this group. High grade lesions, grade III, may also be included if flow cytometry data is not available. This group of patients has a 50-70% chance of freedom from relapse without adjuvant systemic treatment."

11. British Columbia Guideline Set: Sawka C, Olivotto I, Coldman A, Goel V, Holowaty E, Hislop TG, British Columbia/Ontario Working Group. The association between population-based treatment guidelines and adjuvant therapy for node-negative breast cancer. *Br J Cancer* 1997;75(10):1534-1542. (British Columbia province-wide guidelines.)

Guidelines

Table 2 Provincial adjuvant systemic therapy guidelines for node-negative breast cancer in effect in British Columbia in 1991

Diagnostic grouping	1991 Adjuvant systemic therapy guideline
< 50 years low risk	No adjuvant therapy
< 50 years high risk[a]	Chemotherapy
50-65 years low risk	No adjuvant therapy
50-65 years high risk ER positive	Tamoxifen and chemotherapy or tamoxifen
50-65 years high risk ER negative	Chemotherapy
> 65 years low risk	No adjuvant therapy
> 65 years high risk ER positive	Tamoxifen
> 65 years high risk ER negative	No adjuvant therapy

[a] High risk, presence of cancer invasion of lymphatics, blood vessels or nerves (LVN), or tumour > 2 cm if ER negative. Note: if ER unknown, assumed to be positive; if no comment on lymphatic, vascular or neural invasion, assumed to be absent.

13. Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21. (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

- If node-negative patient with adequate level I/II axillary dissection and premenopausal and $\leq$ 1 cm, then no systemic therapy
- If node-negative patient with adequate level I/II axillary dissection and premenopausal and 1.1-3 cm and ER+, then balanced discussion of chemotherapy or tamoxifen $\leq$ 5 years
- If node-negative patient with adequate level I/II axillary dissection and premenopausal and 1.1-3 cm and ER-, then chemotherapy
- If node-negative patient with adequate level I/II axillary dissection and premenopausal and > 3 cm, then chemotherapy
- If node-negative patient with adequate level I/II axillary dissection and postmenopausal and $\leq$ 1 cm, then no systemic therapy
- If node-negative patient with adequate level I/II axillary dissection and postmenopausal and > 1 cm and ER+/-, then balanced discussion on no treatment, tamoxifen $\leq$ 5 years, or chemotherapy
- If node-positive patient, premenopausal and 1-10 nodes, then chemotherapy and balanced discussion of no tamoxifen or tamoxifen $\leq$ 5 years
- If node-positive patient, premenopausal and $\geq$ 10 nodes, then dose intensification with stem

cells, CAF 6 cycles, and balanced discussion of no tamoxifen or tamoxifen $\leq$ 5 years

continued...

13. Love, Parker, et al Guideline Set (continued):

Guidelines

- If node-positive patient, postmenopausal and ER+, then balanced discussion of tamoxifen $\leq$ 5 years or chemotherapy with or without tamoxifen $\leq$ 5 years
- If node-positive patient, postmenopausal and ER-, then balanced discussion of tamoxifen $\leq$ 5 years or chemotherapy with or without tamoxifen $\leq$ 5 years or nothing

Cytotoxic Adjuvant Therapy

- "Conventionally, chemotherapy is initiated within 6 weeks of definitive surgical therapy. Administration of chemotherapy for no more than 6 months appears as beneficial as more prolonged courses."
- "The optimal chemotherapy regimen has not been established. The combination of cyclophosamide, methotrexate, and fluorouracil (CMF) has been studied most extensively and can be considered an accepted standard therapy. Doxorubicin-containing regimens have not been proven superior to CMF for adjuvant therapy, although individual trials using doxorubicin in higher dose-intensity regimens have shown advantages in high-risk patients."
- "Chemotherapy has been associated with greater benefits in premenopausal than in postmenopausal patients; however, administration of full-dose chemotherapy may result in similar benefit to postmenopausal patients as in premenopausal patients."
- "Maintenance of dose intensity of a chemotherapy regimen is associated with maximum benefit."
- "All premenopausal patients with involved lymph nodes should receive adjuvant chemotherapy."

14. NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996. (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "Almost all patients with invasive breast cancer should be offered adjuvant systemic therapy (hormone therapy and/or chemotherapy). Systemic therapy should not be offered or withheld on grounds of age alone."
- "The choice of systemic therapy for individual women should be guided by protocols based on up-to-date research knowledge and agreed by the breast care team. Risks and benefits of different options should be discussed with patients, who should have continuing access to a specialist nurse for support, practice advice and information."
- "Chemotherapy involves a wide range of agents, many of which are toxic and require special care in delivery and dealing with adverse effects. Chemotherapy should only be given in units or centres where close supervision by oncologists and chemotherapy nurse specialists is available, plus expert pharmacy and 24 hour laboratory support. Chemotherapy should be given in a designated daycase area."
- "Patients receiving chemotherapy and their GPs should have access to emergency care, information and advice from oncology trained staff on a 24 hour basis. They should be given

written information on appropriate action for dealing with side-effects of chemotherapy. There should be written protocols on the management of complications and toxicities."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Close communication must be maintained between surgeons and radiotherapist/oncologist to plan primary treatment and facilitate subsequent adjuvant therapy. A care plan for each woman should be drawn. Considerations in framing this must take account of factors predictive of both survival (lymph node status, Nottingham Prognostic Index) and of local or regional recurrence, the age and frailty of the patient, social circumstances and patient preferences. Planning should also allow for the availability of re-constructive surgery for those women who wish for it."
- "The Breast Team should ensure that GPs receive communications that give them a clear understanding of the diagnosis and care plan and toxicity profile of any proposed systemic treatment. Such communications should certainly be sent at the first post-operative review and at the change of any treatment."
- "Radiotherapy and chemotherapy should be carried out by clinical oncologists and medical oncologists who have opted to specialize in breast cancer. They should have special training and interest in breast cancer, be seen as members of the breast care team and treat the patients from the team. They will have expertise in: the use of radiotherapy in breast cancer; the sue of systemic treatments for breast cancer (hormonal or cytotoxic); and the relief of symptoms associated with metastatic breast disease."
- "In cases in which adjuvant chemotherapy is required, the time interval between the decision to give chemotherapy and the start of chemotherapy itself should not exceed 3 weeks. Local protocols may vary this if radiotherapy is being given before chemotherapy."
- "Cytotoxic chemotherapy should be carried out under the supervision of an oncologist who is a member of the Breast Care Team and treating the majority of cases from that unit. The effective delivery of these regimes requires the presence of a doctor or specialist nurse who is capable of intravenous cannulation and treatment, working under the clinical supervision of a consultant with special expertise in anti-cancer drug therapy in breast cancer. There should be adequate pharmacy support. There must also be adequate facilities and medical cover for the management of any complications which may arise. Staff must be aware of, and GPs must be given details of, how to access this cover."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "Because the need for systemic therapy is usually determined by the histology of the tumour and regional lymph nodes, it is reasonable to involve a medical oncologist in treatment planning at a later stage. In certain cases it is appropriate for the medical oncologist to be involved before treatment begins."
- "Cytotoxic regimens of several months duration are more effective than those lasting one

month."

- "A three month anthracycline-based regimen may be equivalent to six months of CMF."

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- "Optimal dose intensity is important to outcome in adjuvant chemotherapy."
- "Because adjuvant systemic therapies have been proved effective they should be considered in the management of all women with high or moderate risk of recurrence after local therapy for early breast cancer."
- "The potential benefit of adjuvant therapy must be considered together with the age, general health and preferences of the woman in deciding whether or not to recommend such therapy in each individual case."
- "Adjuvant systemic therapy should be recommended in women with involved axillary nodes, as this remains the best indication of the risk of recurrence after treatment for early breast cancer."

"POSTMENOPAUSAL WOMEN	
Nodal status	**Suggested adjuvant therapy**
Node-positive	**Receptor-positive women**: tamoxifen for two to five years. In women under 65 or in those with poor prognostic features, chemotherapy given before tamoxifen adds benefit. **Receptor-negative women**: combination therapy
Node-negative	**Receptor-positive women**: tamoxifen for two to five years (note risk of endometrial cancer). **Receptor-negative women**: tamoxifen is of uncertain benefit. Chemotherapy should be considered in younger postmenopausal women and in those with poor prognostic features.
Poor prognostic features are defined as tumors > 20 mm; or tumors 11-20 mm with additional features such as oestrogen and progesterone receptor negativity, vessel space invasion or high histological grade. For patients with good prognostic features (such as those with tumors < 10 mm diameter) adjuvant therapy has no demonstrated benefit."	

18. **Australian Consensus Report Guideline Set: Coates A. Management of early breast cancer: An Australian consensus report. *Oncology* 1995;52:82-85.** (Clinical Oncological Society of Australia, the Australian-New Zealand Breast Cancer Trials Group, the Royal Australasian College of Surgeons Breast Section and the Medical Oncology Group of Australia.)

Guidelines

"**Table 1**. Treatments favoured

	Treatments
Premenopausal	
Node-positive	Combination chemotherapy using 6 cycles of CMF (cyclophosphamide, methotrexate and fluorouracil)[1]
Node-negative	As above in patients with poor prognostic features[2]
Postmenopausal	
Node-positive	Receptor-positive: tamoxifen for > 2 years (often 5); in younger women (aged < 65) or those with poor prognostic features[2], additional benefit has been shown by the administration of combination chemotherapy prior to tamoxifen. Receptor-negative: combination chemotherapy is recommended
Node-negative	Receptor-positive: tamoxifen for 5 years Receptor-negative: no demonstrated benefit from tamoxifen; adjuvant chemotherapy should be considered in younger postmenopausal patients

[1] In recent studies, reported so far in abstract form only, CMF x 6 and AC x 4 (doxorubicin and cyclophosphamide) have been shown to be equivalent in terms of reduction in rates of breast cancer recurrence. CMF x 6 takes 24 weeks and 12 injections, compared with AC x 4 which takes 12 weeks and 4 injections. Short-term side effects are similar except that AC has a higher rate of alopecia. Comparative quality of life information is not available. Also, data on the long-term safety of AC are not available, particularly in patients receiving postoperative radiotherapy.

[2] Poor prognostic features are defined as tumours > 20 mm, or tumours between 11 and 20 mm with additional poor prognostic features such as oestrogen and progesterone receptor negativity, or high histologic grade. For patients with good prognostic factors (e.g. those with tumours < 10 mm diameter) there has been no demonstrated benefit of adjuvant therapy."

19. British Columbia Provincial Guideline Set: Olivotto IA, Coldman AJ, Hislop TG, Trevisan CH, Kula J, Goel V, Sawka C. Compliance with practice guidelines for node-negative breast cancer. *J Clin Oncol* 1997;15(1):216-222.

Guidelines

1991 British Columbia adjuvant systemic therapy recommendations for women with node-negative breast cancer:

- If < 50:
  - if low risk,[29] then "nil"
  - if high risk,[Error! Bookmark not defined.] then chemotherapy[30]
- If 50 to 65:
  - if low risk,[Error! Bookmark not defined.] then "nil"
  - if high risk:[Error! Bookmark not defined.]
    - if positive or unknown ER status, then tamoxifen[Error! Bookmark not defined.] (chemotherapy optional)
    - if negative ER status, then chemotherapy[Error! Bookmark not defined.]
- If > 65:
  - if low risk,[Error! Bookmark not defined.] then "nil"
  - if high risk:[Error! Bookmark not defined.]
    - if positive or unknown ER status, then tamoxifen[Error! Bookmark not defined.]
    - if negative ER status, then "nil"

22. NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990. *Cancer Research and Treatment* 1992;60:383-393. (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- "The many unanswered questions in the adjuvant systemic treatment of node negative breast cancer make it imperative that all patients who are candidates for clinical trials be offered the opportunity to participate. The following recommendations apply only to patients who are not candidates for such trials or who refuse participation.
  - All node negative patients [not in clinical trials] should be made aware of the benefits and risks or adjuvant systemic therapy. The decision to use adjuvant treatment should follow a thorough discussion with the patient regarding the likely risk of recurrence without adjuvant therapy, the expected reduction in risk with adjuvant therapy, toxicities of therapy and its impact on quality of life. Some degrees of

[29] "NOTE. High risk indicates presence of LVN or ER- size > 2 cm in diameter. The guidelines indicated that ER-unknown was to be considered as ER+ and LVN-unknown was to be considered as LVN- for assignment to risk groupings. Low risk indicates all others."

[30] "Chemotherapy was cyclophosphamide, methotrexate, and fluorouracil for 6 months or doxorubicin plus cyclophosphamide for 4 doses, all intravenously every 3 weeks. Tamoxifen was given 20 mg/d for 3 years."

improvement may be so small that they are outweighed by the disadvantages of therapy.

- Adjuvant therapy should consist of either combination chemotherapy or tamoxifen (20 mg/day for at least 2 years)."

continued...

22. NIH Consensus Development Conference Guideline Set (continued):

Guidelines

- "While all node negative patients have some risk for recurrence, patients with tumors less than or equal to 1 centimeter have an excellent prognosis and do not require adjuvant systemic therapy outside of clinical trials."

23. Kings' Fund Consensus Conference Guideline Set: McCarthy M, Bore J. Treatment of breast cancer in two teaching hospitals: A Comparison with consensus guidelines. *Eur J Cancer* 1991;27(5):579-582. (King's Fund Consensus Conference (London) on guidelines for breast cancer treatment.)

Guidelines

- "The consensus statement recognised the use of combination chemotherapy for women under 50, indicating a reduced risk of death in premenopausal women with positive nodes."
- "The benefits [of combination chemotherapy] for women over 50 years were 'substantially less.'" Chemotherapy would be considered along with radiotherapy and endocrine therapy for patients presenting with locally advanced or metastatic disease."
- "Oophorectomy for women under 50 may reduce mortality rates as much as multi-agent chemotherapy."

Table 8
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 6: TAMOXIFEN TREATMENTS

1. International Consensus Panel Guideline Set: Goldhirsch A, Glick JH, Gelber RD, Senn H-J. Meeting highlights: International consensus panel on the treatment of primary breast cancer. *J Natl Cancer Inst* 1998;90(21):1601-1608. (6th International Conference on Adjuvant Therapy of Primary Breast Cancer.)

Guidelines

- For patients with node-negative and node-positive breast cancer...(see Table 3)

Table 3. Adjuvant treatment for patients with node-negative (A) and node-positive (B) breast cancer*

A. Node negative

Patient group	Minimal/low risk	Intermediate risk	High risk
Premenopausal, ER or PgR positive	**None or tamoxifen**	**Tamoxifen ± chemotherapy**† Ovarian ablation‡ GnRH analogue‡	**Chemotherapy + tamoxifen**† Ovarian ablation‡ GnRH analogue‡
Premenopausal, ER or PgR negative	Not applicable	Not applicable	**Chemotherapy**§
Postmenopausal, ER or PgR positive	**None or tamoxifen**	**Tamoxifen ± chemotherapy**†	**Tamoxifen + chemotherapy**†
Postmenopausal, ER or PgR negative	Not applicable	Not applicable	**Chemotherapy**§
Elderly	**None or tamoxifen**	**Tamoxifen** ± chemotherapy	**Tamoxifen** If no ER and PgR expression:

B. Node positive

Patient group	Treatments
Premenopausal, ER or PgR positive	**Chemotherapy + tamoxifen** **Ovarian ablation** (or GnRH analogue) ± tamoxifen‡ Chemotherapy ± ovarian ablation or (GnRH analogue) ± tamoxifen‡
Premenopausal, ER or PgR negative	**Chemotherapy**§
Postmenopausal, ER or PgR positive	**Tamoxifen ± chemotherapy**†
Postmenopausal, ER or PgR negative	**Chemotherapy**§
Elderly	**Tamoxifen** If no ER and PgR expression: **chemotherapy**

* ER = estrogen receptor; PgR = progesterone receptor; GnRH = gonadotropin releasing hormone. Bold entries are treatments accepted for routine use or baseline in clinical trials.

† The addition of chemotherapy is considered an acceptable option based on evidence from clinical trials. Considerations about a low relative risk of relapse, age, toxic effects, socioeconomic implications, and information on patient's preference might justify the use of **tamoxifen alone.**

‡ Indicates treatments still being tested in randomized clinical trials.

§ The addition of tamoxifen following chemotherapy might be considered for patients whose tumors are classified as ER and PgR negative but which exhibit minimal/trace levels of either ER or PgR.

- "For [high-risk] patients with tumors that express estrogen or progesterone receptors, combined chemotherapy and tamoxifen was shown...to be more effective than endocrine therapy alone, irrespective of menopausal status."
- "For patients with minimal/low-risk disease, the question of whether or not to treat with tamoxifen depends on a risk-benefit analysis, which should take into account both the low relapse rate within the first 10 years in these patients and the potential reduction by tamoxifen of the incidence of contralateral breast cancer."

- "Patients classified as intermediate risk may be assigned to receive the same chemoendocrine treatment as the high-risk group, although considerations about a lower relative risk of relapse, age, toxicity, socioeconomic implications, and information on patient's preference might justify the use of tamoxifen alone as an endocrine treatment."

continued...

1. International Consensus Panel Guideline Set (continued):

Guidelines

- "For patients who had their tumors classified as estrogen or progesterone receptor-positive, tamoxifen and chemotherapy with an anthracycline-based regimen or with the classical CMF regimen...yield a significant prolongation of disease-free survival as compared with tamoxifen alone."
- "The use of tamoxifen alone in women of postmenopausal age may, however, be justified based on individual considerations related to risk of relapse, age, and assessment of the patient's preference."
- "For patients with node-negative breast cancer, 5 years is the standard duration of tamoxifen treatment."

3. ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS). *CA Cancer J Clin* 1998;48(2):108-128. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "Until more data become available, the use of tamoxifen outside a clinical trial is not appropriate."

4. CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83. (Canadian Medical Association.)

Guidelines

The Management of Ductal Carcinoma In Situ (DCIS)

- "Evidence is not available to support the use of tamoxifen in the treatment of women with DCIS."

Adjuvant Systemic Therapy for Women with Node-Negative Breast Cancer

- "Women at high risk should be advised to have adjuvant systemic therapy. Chemotherapy should be recommended for all premenopausal women (less than 50 years of age) and for postmenopausal women (50 years of age or older) with ER-negative tumours. Tamoxifen should be recommended as first choice for postmenopausal women with ER-positive tumours. For this last group of patients, it is possible that further benefit may be obtained from the addition of chemotherapy to tamoxifen."
- "For women at intermediate risk with ER-positive tumours, tamoxifen should normally be the first choice. For those who decline tamoxifen, chemotherapy may be considered."
- "For most patients over 70 years of age who are at high risk, tamoxifen is recommended

regardless of ER status. For some who are in robust good health, chemotherapy is a valid option."

- "Tamoxifen should normally be administered daily for 5 years."

continued...

4. CMA Guideline Set (continued):

Guidelines

Adjuvant Systemic Therapy for Women with Node-Positive Breast Cancer

- "Postmenopausal women with stage II, estrogen receptor-positive cancer should be offered adjuvant tamoxifen."
- "No other hormonal intervention apart from tamoxifen can be recommended for postmenopausal patients."
- "The recommended duration of tamoxifen therapy is 5 years."

7. NCCN Guideline Set: Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220. (National Comprehensive Cancer Network)

Guidelines

Noninvasive Breast Cancer

- If LCIS, no adjuvant treatment
- If DCIS, no adjuvant treatment

Invasive Breast Cancer: Node Negative

- If stage I, IIA, IIB, node negative and tumor $\leq$ 0.5 cm or microinvasive, then adjuvant treatment.
- If stage I, IIA, IIB, node negative and histology: tubular collord medullary adenoidcystic and < 1 cm, then no adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: tubular collord medullary adenoidcystic and 1-2.9 cm, then consider adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: tubular collord medullary adenoidcystic and $\geq$ 3 cm, then adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and 0.6-1.0 cm, no unfavorable features, then no adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and 0.6-1.0 cm, unfavorable features ("angiolymphatic invasion, high S-phase, high nuclear grade, high histologic grade"), then consider adjuvant therapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and> 1 cm and hormone-receptor negative, then adjuvant chemotherapy.
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and > 1 cm and hormone-receptor positive, age < 50, > 1 up to 3 cm, then "tamoxifen *or* chemo $\pm$ tamoxifen."
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and > 1 cm hormone-receptor positive, age < 50, > 3 cm, then "chemo $\pm$ tamoxifen."
- If stage I, IIA, IIB, node negative and histology: invasive ductal or lobular and > 1 cm hormone-receptor positive, age $\geq$ 50, > 3 cm, then "tamoxifen, 20 mg/d x 5 yr (if pathologic stage II, plus chemo is optional)."

continued...

7. NCCN Guideline Set (continued):

Guidelines

Invasive Breast Cancer: Node Positive

- If stage I, IIA, IIB node positive and 1-3 nodes: hormone-receptor positive, age < 50, then "adjuvant chemotherapy ± tamoxifen."
- If stage I, IIA, IIB node positive and 1-3 nodes: hormone-receptor positive, age ≥ 50, then "tamoxifen, 20 mg/d x 5 yr (plus chemotherapy optional)."
- If stage I, IIA, IIB node positive and 4+ nodes:[Error! Bookmark not defined.] age ≥ 50, hormone-receptor positive, then "tamoxifen, 20 mg/d x 5 yr (plus chemotherapy optional)."

8. Texas Oncology P.A. Guideline Set: Blum JL, Jones SE, Fay JW, Senzer N, Mennel RG. Guidelines for systemic therapy for early stage breast cancer. *Breast Cancer Research and Treatment* 1997;43:259-276. (Private practice group of oncologists.)

Guidelines

- For patients with node negative breast cancer, minimal-low risk:[Error! Bookmark not defined.] "Since the benefits of chemotherapy and hormonal therapy have not been established for this subgroup of patients, observation alone (after surgery alone or surgery followed by radiation therapy) is recommended. For the patient who wants therapy and who is aware of the risks and benefits, tamoxifen 20 mg daily may be reasonable, particularly for patients with ER and/or PR-positive tumors."
- For patients with node negative breast cancer, good risk:[31] "Tamoxifen 20 mg daily is recommended."
- For patients with node-negative breast cancer: "Standard hormonal adjuvant therapy, particularly for patients with ER and/or PR positive tumors, either by quantitative assays or by immunohistochemistry, is tamoxifen (20 mg daily) for 5 years after chemotherapy is completed or in the absence of chemotherapy."
- "The consensus for node positive patients is that all should receive adjuvant therapy either on a clinical trial or outside of a study."
- For patients with node-positive breast cancer: "Standard hormonal adjuvant therapy, particularly for patients with ER and/or PR positive tumors, either by quantitative assays or by immunohistochemistry, is tamoxifen (20 mg daily) for 5 years after chemotherapy is completed or in the absence of chemotherapy."
- For premenopausal women: "Premenopausal node-positive and moderate-high risk node-negative women should receive chemotherapy. For ER-positive and/or PR-positive premenopausal women, tamoxifen can be considered after completion of chemotherapy, particularly if menopause is induced. No tamoxifen is needed in women with hormone receptor-negative tumors." A treatment summary is given.

[31] "These patients are patients whose tumors are within 1-2 cm in size, ER-positive and/or PR-positive, low S phase, and diploid."

continued...

8. Texas Oncology P.A. Guideline Set (continued):

Guidelines

- For postmenopausal women: "For postmenopausal node positive and moderate-high risk lymph node negative ER-positive and/or PR-positive women, tamoxifen is accepted therapy. However, chemotherapy may have additional benefits in this group of women, particularly if dose intensity is not compromised, and should be strongly considered first, followed by tamoxifen 20 mg daily for 5 years. For postmenopausal ER-negative lymph node positive and moderate-high risk node-negative women, chemotherapy is recommended. These recommendations are in the following tables." A treatment summary is given.

11. British Columbia Guideline Set: Sawka C, Olivotto I, Coldman A, Goel V, Holowaty E, Hislop TG, British Columbia/Ontario Working Group. The association between population-based treatment guidelines and adjuvant therapy for node-negative breast cancer. *Br J Cancer* 1997;75(10):1534-1542. (British Columbia province-wide guidelines.)

Guidelines

Table 2 Provincial adjuvant systemic therapy guidelines for node-negative breast cancer in effect in British Columbia in 1991

Diagnostic grouping	1991 Adjuvant systemic therapy guideline
< 50 years low risk	No adjuvant therapy
< 50 years high risk[a]	Chemotherapy
50-65 years low risk	No adjuvant therapy
50-65 years high risk ER positive	Tamoxifen and chemotherapy or tamoxifen
50-65 years high risk ER negative	Chemotherapy
> 65 years low risk	No adjuvant therapy
> 65 years high risk ER positive	Tamoxifen
> 65 years high risk ER negative	No adjuvant therapy

[a] High risk, presence of cancer invasion of lymphatics, blood vessels or nerves (LVN), or tumour > 2 cm if ER negative. Note: if ER unknown, assumed to be positive; if no comment on lymphatic, vascular or neural invasion, assumed to be absent.

13. Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21. (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

- If node-negative patient with adequate level I/II axillary dissection and premenopausal and $\leq$ 1 cm, then no systemic therapy
- If node-negative patient with adequate level I/II axillary dissection and premenopausal and 1.1-3 cm and ER+, then balanced discussion of chemotherapy or tamoxifen $\leq$ 5 years

continued...

13. Love, Parker, et al Guideline Set (continued):

Guidelines

- If node-negative patient with adequate level I/II axillary dissection and premenopausal and 1.1-3 cm and ER-, then chemotherapy
- If node-negative patient with adequate level I/II axillary dissection and premenopausal and > 3 cm, then chemotherapy
- If node-negative patient with adequate level I/II axillary dissection and postmenopausal and $\leq$ 1 cm, then no systemic therapy
- If node-negative patient with adequate level I/II axillary dissection and postmenopausal and > 1 cm and ER+/-, then balanced discussion on no treatment, tamoxifen $\leq$ 5 years, or chemotherapy
- If node-positive patient, premenopausal and 1-10 nodes, then chemotherapy and balanced discussion of no tamoxifen or tamoxifen $\leq$ 5 years
- If node-positive patient, premenopausal and $\geq$ 10 nodes, then dose intensification with stem cells, CAF 6 cycles, and balanced discussion of no tamoxifen or tamoxifen $\leq$ 5 years
- If node-positive patient, postmenopausal and ER+, then balanced discussion of tamoxifen $\leq$ 5 years or chemotherapy with or without tamoxifen $\leq$ 5 years
- If node-positive patient, postmenopausal and ER-, then balanced discussion of tamoxifen $\leq$ 5 years or chemotherapy with or without tamoxifen $\leq$ 5 years or nothing

Hormonal Adjuvant Therapy

- "Tamoxifen is the accepted standard hormonal adjuvant therapy."
- "Therapy durations for more than 5 years or at a dose in excess of 20 md/day are not recommended. Therapy for at least 2 years (and possibly 5 years) is significantly more effective than shorter tamoxifen regimens."
- "Tamoxifen benefit is greater in patients with estrogen-receptor-positive tumors than in those with estrogen-receptor-negative tumors."
- "Adjuvant ovarian ablation may yield similar survival benefit in premenopausal patients as does adjuvant CMF."
- "All postmenopausal patients with involved lymph nodes and positive status should receive adjuvant tamoxifen."

14. NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996. (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "Almost all patients with invasive breast cancer should be offered adjuvant systemic therapy (hormone therapy and/or chemotherapy). Systemic therapy should not be offered or withheld on grounds of age alone."
- "The choice of systemic therapy for individual women should be guided by protocols based on up-to-date research knowledge and agreed by the breast care team. Risks and benefits of different options should be discussed with patients, who should have continuing access to

a specialist nurse for support, practice advice and information."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Close communication must be maintained between surgeons and radiotherapist/oncologist to plan primary treatment and facilitate subsequent adjuvant therapy. A care plan for each woman should be drawn. Considerations in framing this must take account of factors predictive of both survival (lymph node status, Nottingham Prognostic Index) and of local or regional recurrence, the age and frailty of the patient, social circumstances and patient preferences. Planning should also allow for the availability of re-constructive surgery for those women who wish for it."
- "The Breast Team should ensure that GPs receive communications that give them a clear understanding of the diagnosis and care plan and toxicity profile of any proposed systemic treatment. Such communications should certainly be sent at the first post-operative review and at the change of any treatment."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "Because the need for systemic therapy is usually determined by the histology of the tumour and regional lymph nodes, it is reasonable to involve a medical oncologist in treatment planning at a later stage. In certain cases it is appropriate for the medical oncologist to be involved before treatment begins."
- "Tamoxifen significantly improves recurrence free survival at all ages"
- "Tamoxifen reduces the incidence of contralateral breast cancer."
- "Women on tamoxifen and their doctors should be aware of the risk of endometrial cancer. "Abnormal bleeding should be investigated promptly, and although no good scientific basis for screening for endometrial cancer has been established, women on tamoxifen therapy should be considered for annual gynaecological review."
- "Because adjuvant systemic therapies have been proved effective they should be considered in the management of all women with high or moderate risk of recurrence after local therapy for early breast cancer."
- "The potential benefit of adjuvant therapy must be considered together with the age, general health and preferences of the woman in deciding whether or not to recommend such therapy in each individual case."
- "Adjuvant systemic therapy should be recommended in women with involved axillary nodes, as this remains the best indication of the risk of recurrence after treatment for early breast cancer."
- "Tamoxifen and ovarian ablation may be less valuable in women with ER-negative tumours. As noted above, the proportional benefit of adjuvant systemic therapy is independent of the risk group, but the absolute benefit is smaller in women at inherently low risk. The clinically relevant question of whether to give a particular treatment such as adjuvant systemic

therapy thus involves trading off the adverse effects and inconveniences of the therapy against the expected benefits. There can be no absolute right or wrong answers, but each woman has the right to an unbiased assessment of the factors relevant to her own decision."

17. NHMRC Guideline Set (continued):

Guidelines

"POSTMENOPAUSAL WOMEN	
Nodal status	**Suggested adjuvant therapy**
Node-positive	**Receptor-positive women**: tamoxifen for two to five years. In women under 65 or in those with poor prognostic features, chemotherapy given before tamoxifen adds benefit. **Receptor-negative women**: combination therapy
Node-negative	**Receptor-positive women**: tamoxifen for two to five years (note risk of endometrial cancer). **Receptor-negative women**: tamoxifen is of uncertain benefit. Chemotherapy should be considered in younger postmenopausal women and in those with poor prognostic features.
Poor prognostic features are defined as tumors > 20 mm; or tumors 11-20 mm with additional features such as oestrogen and progesterone receptor negativity, vessel space invasion or high histological grade. For patients with good prognostic features (such as those with tumors < 10 mm diameter) adjuvant therapy has no demonstrated benefit."	

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Guidelines

"**Table 1**. Treatments favoured

	Treatments
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Node-positive	Combination chemotherapy using 6 cycles of CMF (cyclophosphamide, methotrexate and fluorouracil)[1]
Node-negative	As above in patients with poor prognostic features[2]
Postmenopausal	
Node-positive	Receptor-positive: tamoxifen for > 2 years (often 5); in younger women (aged < 65) or those with poor prognostic features[2], additional benefit has been shown by the administration of combination chemotherapy prior to tamoxifen. Receptor-negative: combination chemotherapy is recommended
Node-negative	Receptor-positive: tamoxifen for 5 years Receptor-negative: no demonstrated benefit from tamoxifen; adjuvant chemotherapy should be considered in younger postmenopausal patients

[1] In recent studies, reported so far in abstract form only, CMF x 6 and AC x 4 (doxorubicin and cyclophosphamide) have been shown to be equivalent in terms of reduction in rates of breast cancer recurrence. CMF x 6 takes 24 weeks and 12 injections, compared with AC x 4 which takes 12 weeks and 4 injections. Short-term side effects are similar except that AC has a higher rate of alopecia. Comparative quality of life information is not available. Also, data on the long-term safety of AC are not available, particularly in patients receiving postoperative radiotherapy.

[2] Poor prognostic features are defined as tumours > 20 mm, or tumours between 11 and 20 mm with additional poor prognostic features such as oestrogen and progesterone receptor negativity, or high histologic grade. For patients with good prognostic factors (e.g. those with tumours < 10 mm diameter) there has been no demonstrated benefit of adjuvant therapy."

22. NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990. *Cancer Research and Treatment* 1992;60:383-393. (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- "The many unanswered questions in the adjuvant systemic treatment of node negative breast cancer make it imperative that all patients who are candidates for clinical trials be offered the opportunity to participate. The following recommendations apply only to patients who are not candidates for such trials or who refuse participation.
  - All node negative patients should be made aware of the benefits and risks or adjuvant systemic therapy. The decision to use adjuvant treatment should follow a thorough discussion with the patient regarding the likely risk of recurrence without adjuvant therapy, the expected reduction in risk with adjuvant therapy, toxicities of therapy and its impact on quality of life. Some degrees of improvement may be so small that they are outweighed by the disadvantages of therapy.
  - Adjuvant therapy should consist of either combination chemotherapy or tamoxifen (20 mg/day for at least 2 years)."
- "While all node negative patients have some risk for recurrence, patients with tumors less than or equal to 1 centimeter have an excellent prognosis and do not require adjuvant systemic therapy outside of clinical trials."

23. Kings' Fund Consensus Conference Guideline Set: McCarthy M, Bore J. Treatment of breast cancer in two teaching hospitals: A Comparison with consensus guidelines. *Eur J Cancer* 1991;27(5):579-582. (King's Fund Consensus Conference (London) on guidelines for breast cancer treatment.)

Guidelines

- "The consensus statement recognised that primary treatment with tamoxifen reduced mortality rates in women over 50 but only reduced the relapse rate in women under 50."

Table 9
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 7: CARE FOLLOWING INITIAL SURGERY/RADIOTHERAPY

2. ACR/ACoS/CAP/SSO Guideline Set #1: Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "Regular history and physical examination with breast imaging are the cornerstones of effective follow-up care."

Physical Examination

- "Local failure occurs at a constant rate in the time interval; therefore, frequency of examination should be based on risk factors for both local and distant recurrence. The intervals for examination are as follows:
  Every 3 to 6 months, years 1 to 3. This interval varies for patients receiving adjuvant chemotherapy, who need more frequent assessment during their active treatment.
  Every 6 months, years 4 and 5. Some investigators prefer to continue semiannual examinations through year 8 because the rate of local recurrence is constant through that time interval.
  Annually after year 5. More frequent follow-up may be needed for patients at exceptionally high risk."

Mammography

- "Postoperative and irradiation changes overlap with signs of malignancy on a mammogram; health professionals should know this so they can avoid unnecessary biopsy. The changes include masses (postoperative fluid collections and scarring), edema, skin thickening, and calcifications."
- "For accurate interpretation of mammograms and assessment of the direction of change, the current mammogram must be compared in sequence with preceding studies. The diagnostic radiologist can tailor mammographic studies of the treated breast to the surgical site by using special mammographic views in addition to routine mediolateral oblique and craniocaudal views. Magnification and spot compression can be used with any view to increase detailed visualization of the site of tumor excision and other areas."
- "Magnification mammography is useful to classify calcifications morphologically and to quantitate them. In some cases, a view with the x-ray beam tangential to the scar and other oblique views help to differentiate recurrent tumor from postoperative changes."
- "Ultrasonography can characterize a postoperative mass, such as a seroma, as fluid filled rather than solid. As these masses resolve and scars form, a spiculated soft tissue density that mimics tumor may be seen on the mammogram. Additional radiographic projections of the site of tumor removal facilitate more confident radiographic interpretations."

continued...

2. ACR/ACoS/CAP/SSO Guideline Set #1 (continued):

Guidelines

Schedule of Imaging of the Treated Breast

- "A baseline mammogram should be performed for comparison 3 to 9 months after tumor excision and completion of all therapies."
- "Thereafter mammography should be done at least annually or at more frequent intervals as warranted by clinical or radiographic findings."

Schedule of Imaging of the Contralateral Breast

- "Mammography should be performed annually, according to the guidelines endorsed by both the American College of Radiology and the American Cancer Society and with synchronization of surveillance mammography of the treated breast. More frequent intervals may be warranted by clinical or radiographic findings."

Other Tests

- "Symptomatic patients are justifiably evaluated with other medical tests (e.g., radionuclide bone scan, chest radiography, computerized tomography [CT] scans, liver function tests) as indicated by the character of their medical problem. An annual chest radiograph may be appropriate in patients who smoke. Randomized controlled trials have shown that routine use of these tests provides no benefit for asymptomatic patients with stage I or II breast carcinoma. No survival benefits have been shown, and the cost-effectiveness of using such procedures in routine follow-up is seriously in question."

3. ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS). *CA Cancer J Clin* 1998;48(2):108-128. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "Without mature data from clinical trials, it is the collective responsibility of the surgeon, pathologist, radiation oncologist, and radiologist to integrate all available data so that treatment options and recommendations can be articulated clearly to the patient."

Follow-up Care Recommendations

- "Follow-up assessment of the results of breast-conservation treatment should be provided by surgeons and oncologists experienced in that treatment as outlined in this standard, and it should also evaluate the cosmetic outcome as well as the functional consequences."
- "Regular history and physical examination in conjunction with breast imaging are the cornerstones of effective follow-up care....Routine tests such as bone scanning, chest radiography, computerized tomography (CT) scanning, and liver function tests are not

indicated for asymptomatic patients treated for DCIS. A public education effort is needed to address this problem."

continued...

3. ACR/ACoS/CAP/SSO Guideline Set #2 (continued):

Guidelines

History and Physical Examination

- "The frequency of examination, which is based on optimal timing for identification of local recurrence and second primary tumors, is as follows:
  1. Every 6 months, years 1 to 5 (some oncologists prefer every 6 months until after year 8, when the risk of local recurrence with breast-conservation treatment begins to approach the risk of contralateral breast cancer)
  2. Annually thereafter"

Mammography

- "The current mammogram must be compared in sequence with the preceding studies so that it can be accurately interpreted and the direction of change can be assessed accurately. The diagnostic radiologist should carefully tailor mammographic studies of the treated breast to the surgical site by using special mammographic views in addition to routine mediolateral oblique and craniocaudal views. Magnification and spot compression can be used with any view to increase detailed visualization of the site of tumor excision and other areas. Magnification radiography is useful for classifying calcifications morphologically and quantitating them. Other special views may be useful in the assessment of the breast after conservation."
- "As postoperative masses resolve and scars form, a spiculated mass that mimics tumor may be seen on the mammogram. Additional radiographic projections of the site of tumor removal facilitate more confident radiographic interpretations."
- "A postoperative mammogram is essential to ensure that microcalcifications have been removed in patients having breast-conservation treatment with or without irradiation. The site of the excision may be optimally evaluated with magnification radiography for residual microcalcifications if none are seen on routine views."
- "A baseline mammogram is done during the first year after breast-conservation treatment and at least annually thereafter or at more frequent intervals as warranted by clinical or radiographic findings."
- "The contralateral breast should undergo mammography annually, according to the guidelines endorsed by both the American College of Radiology and the American Cancer Society. More frequent intervals may be warranted by clinical or radiographic findings."

4. Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83.

Guidelines

Follow-Up After Treatment for Breast Cancer

- "All patients who have completed their primary treatment for breast cancer should have regular follow-up surveillance."
- "The frequency of follow-up visits should be adjusted according to individual patient's needs. The following issues and schedule should be considered:
  (a) The need to discuss and manage early side effects of therapy, plan a follow-up program and provide general support. (This visit is usually scheduled 4 to 6 weeks after therapy)
  (b) The need to establish a post-treatment baseline, detect early recurrences and teach breast self-examination. (This visit is usually 4 to 6 months after therapy.)
  (c) The need for regular physical and mammographic examination to detect potential curable disease. (These examinations should be at approximately 1-year intervals indefinitely thereafter.)
  (d) The need to provide support and counseling may require additional visits for some women, particularly for the first few years.
  (e) If metastases develop, the frequency of visits must be determined by the symptoms, course of disease and need for further treatment."
- "The responsibility for follow-up care should be formally allocated to a single physician, with the patient participating as much as possible. The patients should always be fully informed of these arrangements."
- "Communication between all members of the therapeutic team must be ensured to avoid duplication of visits and tests."

7. NCCN Guideline Set: Update of the NCCN guidelines for treatment of breast cancer. *Oncology* 1997;11(11A):199-220. (National Comprehensive Cancer Network)

Guidelines

Noninvasive Breast Cancer

- If LCIS or DCIS, physical exam every 6 months.
- If LCIS and observation management, mammography every 12 months.
- If DCIS, mammography every 12 months.

Invasive Breast Cancer

- If stage I, IIA, or IIB:
  - physical exam every 4 months for 2 years, every 6 months for 3 years, then every 12 months;
  - mammography every 12 months;

- routine chemistry screening every 12 months;
- women on tamoxifen treatment: pelvic exam every 12 months.

8. **Texas Oncology P.A. Guideline Set: Blum JL, Jones SE, Fay JW, Senzer N, Mennel RG. Guidelines for systemic therapy for early stage breast cancer. *Breast Cancer Research and Treatment* 1997;43:259-276.** (Private practice group of oncologists.)

Guidelines

- "Asymptomatic patients with the history of unilateral, invasive, operable, breast cancer should be followed by periodic physical examination, yearly mammography, and routine laboratory tests such as a CBC and SMA 20. For patients with history of bilateral breast cancer who have had mastectomies, follow up is identical except for mammography which is omitted. A periodic chest x-ray may be obtained but there is no proven role for surveillance chest x-rays, bone scans, CT scans, or liver sonography. Patients who have had lumpectomy and radiation therapy may need more frequent mammography, every 6 months during the first year or two from diagnosis."
- "Additional diagnostic tests are recommended if clinically indicated. A reasonable follow-up schedule is every three months for the first two years, then every six months for the next three years, and then yearly after five years."
- "Patients on tamoxifen should have routine annual gynecological follow-up, and unusual vaginal bleeding needs to be investigated promptly to exclude uterine cancer."

10. **ESSO Guideline Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109.** (European Society of Surgical Oncology.)

Guidelines

- "All patients treated for breast cancer should have access to expert opinion and specialized investigation if symptoms develop."
- "A follow-up model similar to the nationwide Danish protocol, is recommended. In this system patients below the age of 75 years are advised to attend the Clinic every 6 months for 5 years, then annually for a further 5 years. At each visit physical examination is carried out and case report forms are completed. For patients over 50 years of age mammography every other year is advised. For low-risk patients further investigations are not undertaken unless warranted by symptoms or physical findings. In high-risk patients additional investigations are carried out according to specified protocol needs."
- "...follow-up regimes should remain uniform, definition of recurrent disease should be standardized and oncological endpoints in multi-centre studies be agreed in order to ensure inter-group comparability."

13. **Love, Parker, et al Guideline Set: Love S, Parker B, Ames M, Taylor C, Gilden R, Figlin RA. Practice guidelines for breast cancer. *Cancer Journal from Scientific American* 1996;2(3A):S7-S21.** (Acknowledgments include the Revlon/UCLA Breast Cancer Center and members of the University of California Cancer Consortium Breast Cancer Clinical Pathways Committee.)

Guidelines

Carcinoma In Situ

- If DCIS treated with breast conservation and radiotherapy, then "regular mammography and physical examination to detect local recurrence."
- If DCIS treated with radiotherapy or mastectomy, then also "regular physical and mammographic examinations of the contralateral breast."
- If LCIS, then exams every 6 months and yearly mammograms.

Early Stage Breast Cancer: Stage I and II

- If early stage breast cancer treatment, then mammogram and physical exam within 6 months, every 6 months thereafter for 2 years, annually thereafter.

14. **NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996.** (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "Psychosocial support should be available at every stage to help patients and their families cope with the effects of the disease. These issues should be considered in the design and provision of all aspects of treatment services. Health care personnel should have training to improve their ability to recognise the psychological needs of patients and to deal with them appropriately."
- "Social support should be available and there should be close liaison with local social services."
- "At the end of primary treatment, the patient and specialist should agree a written care plan. Intensive follow-up of women who have been treated for primary breast cancer should not be offered by the breast unit as a matter of routine. Women and their GPs should be reassured that routine tests to detect metastatic cancer are not necessary because they do not improve quality of life or survival. However, regular mammography is important to detect local recurrence or a second primary in the other breast."
- "Locally agreed measures should be developed to support the woman's transition from treatment by the unit. This should be designed to minimise anxiety and should include both verbal and written information on signs and symptoms which should be reported. Each woman should have a contact number for her breast care nurse and should be aware of other ways of accessing the specialist breast care team."
- "General practitioners should be involved in shaping local arrangements for follow-up whenever routine breast unit follow-up is to be discontinued or reduced in scale. They will

need information on new arrangements and may need access to training in relevant aspects of breast cancer. Health Authorities should work with Postgraduate Deans to ensure that such training is available."

continued....

14. NHS Guideline Set (continued):

Guidelines

- "Optimal delivery of services described in previous sections requires co-ordinated work by a multidisciplinary team of people with particular expertise in breast cancer care. The team would include clinicians who have specialised knowledge of each aspect of diagnosis and treatment, and specialised nursing and staff who give support to patients. A lead clinician should be designated who will take responsibility for the work of the team as a whole, communication with patients, implementation of change, and audit."
- "The breast care team should be made up of individuals who have experience with breast cancer patients, substantial fixed time commitment to breast cancer patients, and where appropriate, specialist qualifications in breast cancer work."
- "The core breast team should include the following:" designated breast surgeon(s); breast care nurse(s); pathologist; radiologist; oncologists.
- "The [breast cancer] team as a whole should be responsible for planning care in a seamless way so that each patient receives prompt and appropriate care throughout the process of diagnosis and treatment, up to and including the period when palliation may be needed. The team must maintain close contact with all other professionals who are actively involved in supporting the patient or carrying out the treatment strategy decided by the core team."
- "At any one time, a named member of the team should be the principal clinician to whom the patient relates, e.g. the surgeon in the early stages of the disease, the oncologist during the phase of adjuvant treatment, and the palliative care physician at a late stage. It is important that such arrangements should be explicit and properly understood by patients. Patients should be given information about the members of the team involved in their management."
- "The core team should work closely together and meet on a regular basis (normally weekly) to discuss each patient with confirmed breast cancer both after initial diagnosis and after surgery to plan and monitor treatment. Decisions about future treatment should be discussed at these meetings in relation to clinical practice guidelines and protocols agreed by the team.... The team itself should also work according to a written protocol which specifies how quickly decisions should normally be made about diagnosis and treatment."
- "The team must have adequate support to ensure that all decision are recorded and communicated to patients and all those outside the core team...who require, or may benefit from, information about decisions made by the team about the care of particular patients."
- "All breast referrals should be to specialist breast teams working in units which deal with at least 100 new cases of breast cancer per year (a level which may be anticipated from a population of around 200,000 people). This throughput figure should apply to the breast team as a whole (which may operate across more than one hospital), rather than to individual members or the whole institution."
- "Effective communication between professionals, and between primary, secondary and tertiary sectors of care, is extremely important. The breast care team must develop and implement systems that ensure rapid and effective communication between all healthcare professionals involved in each patient's management. There should be adequate means for communicating information on referral, diagnosis and treatment, follow-up and supportive/palliative care. District Nurses and Practice Nurses in primary care must be linked into the communication network and aware of referral criteria and routes to the breast care team for women who have been treated for breast cancer."

continued....

14. NHS Guideline Set (continued):

Guidelines

- "There should be sufficient administrative support, and the unit should be equipped with up-to-date facilities to aid communication. Rapid communication with each patient's GP of diagnosis, treatment plans and treatment given, and with hospices and palliative care teams, is particularly important. The need for confidentiality should be recognised in all communication."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Close communication must be maintained between surgeons and radiotherapist/oncologist to plan primary treatment and facilitate subsequent adjuvant therapy. A care plan for each woman should be drawn. Considerations in framing this must take account of factors predictive of both survival (lymph node status, Nottingham Prognostic Index) and of local or regional recurrence, the age and frailty of the patient, social circumstances and patient preferences. Planning should also allow for the availability of re-constructive surgery for those women who wish for it."
- "In a case in which treatment with breast conservation is unwise and mastectomy is to be, or has been, carried out there should be the opportunity for patients to receive advice on reconstructive breast surgery."
- "Patients should be supported by a clinical nurse specialist (Breast Care Nurse), who is a member of the Breast Team and should have established links with the ward nurses to assist in continuity of care."
- "Patients should be informed about the range of services available to them and provided with literature to take home, including details of further follow-up treatment and information about local self-help support groups. Since support groups may be well-meaning whilst misinformed on occasions, it is desirable that they should only work with patients under the direction of the Breast Care Nurse."

Follow-up regarding "Local recurrence within the treated breast, when this has been conserved"

- "Local recurrence is defined as further breast cancer within the skin or parenchyma of the treated breast (whether considered a recurrence or new primary tumour)."
- "The unit must have a written protocol to decide which patients have tumours that are suitable for conservation therapy—if a tumour has unsuitable features then mastectomy should be advised."
- "The detection of local recurrence following conservation surgery requires the same approach as the detection of a primary breast cancer. It should therefore be the responsibility of the surgeon, and follow-up should be conducted in a breast follow-up clinic by the surgical team with the cooperation of other members of the diagnostic breast team,

working to standards that are the same as for the diagnosis of primary breast cancer."

continued...

16. BASO Guideline Set (continued):

Guidelines

Follow-up regarding "Local recurrence within the treated breast, when this has been conserved" (continued)

- "The optimum frequency of clinical follow-up is not established but we suggest the patient is followed up every 6 months for the first 5 years and annually thereafter."
- "Similarly the ideal frequency for mammographic investigation is not established but we suggest annual mammography of the treated breast."
- "Facilities should be available to allow these."

Follow-up regarding "Local recurrence following mastectomy"

- "We suggest that patients should be seen every 6 months after mastectomy for the first 5 years and annually thereafter. However, cases at high risk of developing distant, local or regional recurrence should be seen at more frequent intervals. Such patients should be identified from the prognostic factors available and more frequent follow-up arranged for them. Whether regularly followed-up or not, women who have undergone treatment for primary breast cancer should have open access to a follow-up clinic, should the be worried about any sign or symptom."
- "If a General Practitioner detects recurrence referral should whenever possible be back to the Breast Unit and not to some different surgeon or oncologist. This implies that there must be a clear mechanism for the General Practitioner to have access to the Breast Unit when problems arise."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "The responsibility of the GP in ongoing care of the whole patient is helped by the receipt of timely, comprehensive and concise letters with adequate information about the management plan, including copies of pathology reports and other relevant investigations."
- "In all cases, the woman will require a varying degree of support ranging from practical advice about obtaining a breast prosthesis after mastectomy to professional counselling when emotional or psychological problems occur. Clinicians who treat women with breast cancer should encourage them to access appropriate support services."
- [with breast conserving surgery] "continuing follow-up is advised as all woman who have had a cancer of the breast have a small but definite increased risk of developing a new cancer in the residual breast tissue."

18. **Australian Consensus Report Guideline Set: Coates A. Management of early breast cancer: An Australian consensus report.** ***Oncology*** **1995;52:82-85.** (Clinical Oncological Society of Australia, the Australian-New Zealand Breast Cancer Trials Group, the Royal Australasian College of Surgeons Breast Section and the Medical Oncology Group of Australia.)

Guidelines

- "Continuing care should be coordinated through the patient's general practitioner as the impact of treatment may last longer than therapy and support must be continued."
- "Follow-up after local treatment for breast cancer should include regular physical examination and mammography to detect early recurrence or the appearance of a new primary tumour. No survival benefit has been found for the routine use of bone scans, chest x-rays, liver imaging, or blood tests in the follow-up of asymptomatic patients."

Table 10
PUBLISHED BREAST CANCER GUIDELINES

DOMAIN 8: TREATMENT OF MORBID AND COMORBID SYMPTOMS, SIGNS, AND CONDITIONS

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2. ACR/ACoS/CAP/SSO Guideline Set #1: Winchester DP, Cox JD. Standards for diagnosis and management of invasive breast carcinoma. *CA Cancer J Clin* 1998;48(2):83-107. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

- "Exercise may be prescribed early in the postoperative period. Early postoperative exercise may prolong axillary drainage, but it prevents frozen shoulder. Shoulder immobilization with arm slings and wraps should be avoided."

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3. ACR/ACoS/CAP/SSO Guideline Set #2: Winchester DP, Strom EA. Standards for diagnosis and management of ductal carcinoma in situ (DCIS). *CA Cancer J Clin* 1998;48(2):108-128. (American College of Radiology/American College of Surgeons/College of American Pathologists/Society of Surgical Oncology.)

Guidelines

Evaluation of Sequelae

- "At the time of the first follow-up examination and serially thereafter, the physician should evaluate the patient for any treatment-related toxicities. This evaluation should include the following:
  1. Assessment of the overall cosmetic result. A four-point scoring system is recommended for assessing the cosmetic result
  2. Patient evaluation of results. The patient's evaluation of treatment outcomes in terms of psychological, functional, and cosmetic consequences should be taken into account in the follow-up process."

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4. CMA Guideline Set: Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. A Canadian Consensus Document. *Canadian Medical Association Journal* 1998;158(3 Suppl):S1-S83. (Canadian Medical Association.)

Guidelines

Follow-Up After Treatment for Breast Cancer

- "All visits should include a medical history. For women who are taking tamoxifen, it is important to ask about vaginal bleeding. Physical examination should include both breasts, regional lymph nodes, chest wall and abdomen. The arms should be examined for lymphedema. Annual visits should include mammographic examination."

- "Routine laboratory and radiographic investigations should not be carried out for the purpose of detecting distant metastases."

continued...

4. CMA Guideline Set (continued):

Guidelines

Follow-Up After Treatment for Breast Cancer (continued)

- "Patients should be encouraged to report new, persistent symptoms promptly, without waiting for the next scheduled appointment."
- "Breast self-examination should be taught to those women who wish to carry it out."
- "Psychosocial support should be encouraged and facilitated."

The Management of Chronic Pain in Patients With Breast Cancer

- "The nature and severity of pain should be carefully evaluated using the history and physical examination. Psychosocial and emotional factors must also be identified. Adequacy of pain control should be evaluated regularly."
- "The first objective in the management of pain due to cancer is to identify the cause and treat it whenever feasible."
- "The first priority of treatment is to control pain rapidly and completely, as judged by the patient. The second priority is to prevent recurrence of pain. The administration of analgesic medication should be based on a regular schedule, around the clock, with additional doses for breakthrough pain when necessary."
- "When drug therapy is necessary, the World Health Organization (WHO) 3-step approach to the use of analgesics is recommended."
- "The oral route should be the first choice of opioid administration."
- "If the oral route fails, transdermal or rectal administration should be considered."
- "When parenteral administration is necessary, the intravenous or subcutaneous routes can be used according to circumstances. Intramuscular administration of opioids is not recommended."
- "Careful observation and titration are required when switching from 1 opioid to another, particularly when the patient is already receiving a high dosage."
- "When converting a patient from long-term oral use of morphine or hydromorphone to parenteral use, a ratio of 3:1 should usually be employed. (This ratio increases to 6:1 for opioid-naïve patients.)"
- "After initiating morphine or making any change of dose or route of administration, the dosage should be evaluated after approximately 24 hours."
- "Tolerance to opioids must not be confused with physical dependence or psychological dependence (so-called "addiction")."
- "Patients should be made aware of possible side effects of medications and should be encouraged to maintain a diary for recording medications taken, dosages and adverse events."
- "Adjuvant analgesics should be administered, when necessary, with an opioid or nonopioid analgesic."
- "Noninvasive measures such as psychosocial interventions and physical modalities may bring significant relief."
- "Neuroinvasive procedures are rarely required and should only be considered when other interventions have failed."

12. Irish Society of Surgical Oncology Guideline Set: McDermott EW. Irish guidelines for surgeons in the management of breast cancer. *Ir Med J* 1997;90(1):6-8.

Guidelines

- "All patients undergoing total mastectomy should be offered reconstruction at a later date."

14. NHS Guideline Set: NHS Executive. Guidelines for Purchasers. Improving Outcomes in Breast Cancer. The Manual. 1996. (National Health Service, Cancer Guideline subgroup of the Clinical Outcomes Group, United Kingdom.)

Guidelines

- "Patients should also be informed about sources of social and practical help, such as local support groups and disability and benefits helplines, both verbally and in written form. Information should be provided in appropriate languages for patients from ethnic minorities."
- "After surgery, women should be given information on wound care, advice on exercise, and information on dealing with the after-effects of surgery. Support and counselling should be available, women should be given the opportunity to talk over their feelings and fears with an experienced breast care nurse."
- "Patients receiving chemotherapy and their GPs should have access to emergency care, information and advice from oncology trained staff on a 24 hour basis. They should be given written information on appropriate action for dealing with side-effects of chemotherapy. There should be written protocols on the management of complications and toxicities."

15. U.K. Lymphoedema Project Guideline Set: Kirshbaum M. The development, implementation and evaluation of guidelines for the management of breast cancer related lymphoedema. *Eur J Cancer Car*e 1996;5:246-251.

Guidelines

- For assessment of lymphoedema:
  - "It is vital that the patient is seen by a breast specialist/oncologist to assess medically the cause of arm swelling (i.e., metastatic disease causing venous obstruction, lymphostatic disorders) before initiating treatment for lymphoedema."
  - "If no further medical treatment is recommended, referral can then be made to an appropriately trained professional (nurse, physiotherapist) for assessment of limb volume, function and psychological effects."
- For treatment of lymphoedema:
  - "1. Skin care
  - 2. Compression hosiery
  - 3. Teaching of self massage
  - 4. Movement and exercise programme
  - 5. Advice on activities of daily living
  - 6. Psychological support"

continued...

15. U.K. Lymphoedema Project Guideline Set (continued):

Guidelines

- For evaluation of lymphoedema: "The patient should express satisfaction with their treatment and the result achieved specifically in regard to receipt of advice, prompt assessment and care of the 'at risk' arm. Ongoing active treatment should achieve a reduction in the size of the arm which is maintained, improvement in the shape of the arm, improvement in movement and functional skills, and the abolition of infections."

16. BASO Guideline Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Guidelines

- "Following initial surgery, the fitting and supply of breast prostheses should be explained to patients."

17. NHMRC Guideline Set: National Health and Medical Research Council (NHMRC) National Breast Cancer Centre (Australia), Clinical Practice Guidelines for the Management of Early Breast Cancer. Commonwealth of Australia 1995. Http://www.nbcc.org.au/pages/info/resource/nbccpubs/clinprof/principl.htm

Guidelines

- "The responsibility of the GP in ongoing care of the whole patient is helped by the receipt of timely, comprehensive and concise letters with adequate information about the management plan, including copies of pathology reports and other relevant investigations."
- "The referral should also establish an ongoing communication between the general practitioner and the specialist. General practitioners require prompt, clear information in writing about management decisions, follow-up plans and patient progress."
- "Most women adjust better to having breast cancer if they have good emotional support from family and friends. There is evidence that some women who receive psychological support in formal treatment groups experience psychological benefit as a result (level II).

  Appropriate counselling has the potential to improve quality of life (level II). All involved in the care of the woman should contribute to counselling and support. In particular, women value support provided by their doctor."

- "Although the risk of arm lymphoedema is small, this complication can occur in any case where a thorough dissection of the axillary contents has been carried out.

  The risk is increased substantially by the addition of radiation treatment to a surgically dissected axilla, and it remains high throughout the woman's life. Doctors caring for such women should ensure that full instructions are given about the prevention of lymphoedema."

- "Women should be given the opportunity to consider [breast reconstruction], so they can balance the advantages and disadvantages of reconstruction after mastectomy."

continued...

17. NHMRC Guideline Set (continued):

Guidelines

- "The best ways to reduce the swelling of lymphoedema are to wear a special garment designed to compress the limb, and to have regular massage to the arm (**level IV**). The management of lymphoedema requires the input of both medical practitioners and physiotherapists.

  Women who have lymphoedema, or who have had both surgery and radiotherapy to the axilla resulting in a high risk of developing lymphoedema, need to look after their arm carefully as the risk of infection is high. They should be advised in the following manner:
  - don't allow anybody to take blood, check your blood pressure, put a drip or give an injection or vaccination in the affected arm;
  - don't carry anything heavy with the affected arm;
  - don't garden without gloves and long sleeves;
  - don't wash the dishes without gloves;
  - don't let your arm become sunburnt;
  - avoid cuts, burns and insect bites;
  - wear loose clothing and loose jewellery;
  - use skin cream to keep the skin of your arm moist;
  - keep cool during hot weather;
  - if you cut your arm or develop an infection in the arm on the same side as your cancer, see your doctor immediately to get antibiotics."

22. NIH Consensus Development Conference Guideline Set: NIH Consensus Development Conference Statement. Early stage breast cancer: Consensus statement, June 18-21, 1990. ***Cancer Research and Treatment*** **1992;60:383-393.** (National Institutes of Health Consensus Development Conference on Treatment of Early-Stage Breast Cancer.)

Guidelines

- "When mastectomy is indicated or selected, breast reconstruction should be considered to improve the cosmetic result."

Table 11: RECOMMENDED MEASURES (NOTE: If measures apply to multiple domains, they are listed in each domain to which they apply.)

#	MEASURES	Domain 1 Recognition, Diagnosis, Severity Assessment, Referral	Domain 2 Initial Surgical Treatment	Domain 3 Patient Choice of Treatment	Domain 4 Radiotherapy Treatment	Domain 5 Chemo-therapy Treatment	Domain 6 Tamoxifen Treatment	Domain 7 Care Following Initial Surgery/ Radiotherapy	Domain 8 Treatment of M & Comorbi Symptoms, Si and Conditio
1	**RAND Proposed Measures**	X	X	X	X	X	X	X	X
2	**FAcct Process Measures**		X	X	X				
3	**Joint Commission on Accreditation of Healthcare Organizations (JCAHO) IMSytem Measures**[32]	X							
4	**Guadagnoli**[33] **(1998) Research Performance Measures**		X		X	X	X		
5	**Kurowski**[34] **(1998) Common Performance Measures**	X	X		X	X	X	X	X
6	**Potosky**[35] **(1997) Treatment Measures**		X						
7	**Hillner**[36] **(1997) Report Card Measures**	X	X	X	X	X	X	X	X
8	**West**[37] **(1997) Proposed Performance Measures**	X	X						
9	**Ma**[38] **(1997) Research Performance Measures**	X	X		X	X	X		X
10	**Blichert-Toft**[39] **(1997) Practice Guidelines from the**	X	X					X	

[32] The Presidents and Fellows of Harvard College. Conquest 1.0: Overview of final report and user's guide. Produced under AHCPR contract number 282-91-0070;1996.

[33] Guadagnoli E, Shapiro CL, Weeks JC, Gurwitz JH, Borbas C, Soumerai SB. The quality of care for treatment of early stage breast carcinoma. Is it consistent with national guidelines? *Cancer* 1998;83:302-309.

[34] Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

[35] Potosky AL, Merrill RM, Riley GF, Taplin SH, Barlow W, Fireman BH, Ballard-Barbash R. Breast cancer survival and treatment in health maintenance organization and fee-for-service settings. *J Natl Cancer Inst* 1997;89:1683-1691.

[36] Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.

[37] West JG, Sutherland L, Link JS, Margileth DA. A breast cancer care report care. An assessment of performance and a pursuit of value. *West J Med* 1997;166:248-252.

[38] Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality? *Br J Cancer* 1997;75(11):1652-1659.

[39] Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109.

	European Society of Surgical Oncology (ESSO)								
11	British Association of Surgical Oncology[40] (1995) Guidelines for Surgeons in the Measurement of Symptomatic Breast Cancer	X	X	X	X			X	
12	Medicare Quality Indicator System (MQIS)[41]				X				

[40] Breast Surgeons Group of the British Association of Surgical Oncology. Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13.

[41] Personal communication with Cindy Wark, Director of the Division of Acute and Chronic Disease Management, Clinical Quality Measures Group, Office of Clinical Standards and Quality, Health Care Financing Administration, December 22, 1997.

Table 12
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 1: RECOGNITION AND DIAGNOSIS OF THE BREAST PROBLEM, SEVERITY ASSESSMENT, AND REFERRAL

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

If the patient presents to the provider with a breast abnormality:

- the patient's concerns should be listened to by the provider.
- multiple providers involved with the care of the breast problem should coordinate the necessary information about the patient so that she has the benefit of all of their input.
- she should be involved as much as she wants in the decisions about how to proceed with the breast problem.

If the patient has a diagnostic procedure of the breast to rule out breast cancer, then during the period of diagnosis of breast cancer that involves the use of diagnostic procedures:

- the procedures should be explained in a way the patient can understand.
- the procedure performing provider should have adequate information about the patient.
- the patient should be involved as much as she wants in the decisions about the procedure.
- the diagnostic procedure should be separate (e.g., by > 3 days) from the therapeutic intervention for patients receiving mastectomy.

3. JCAHO IMSystem Measure Set: The Presidents and Fellows of Harvard College. Conquest 1.0: Overview of final report and user's guide. Produced under AHCPR contract number 282-91-0070;1996.

Proposed Measures

- If female patient with Stage I or greater primary breast cancer undergoing initial biopsy or resection, then estrogen receptor test for breast cancer.
- If female patient undergoing resections for primary cancer of the breast, then:
  - surgical pathology consultant report (with histologic type, in situ or invasive type noted, lymph node examination, pTN noted, size of invasive tumor, and status of margins.)
  - stage of tumor designation.

5. **Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.**

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with more than stage 1 breast cancer with receptor status documented." Required or reported by JCAHO, FACCT, Accountable Oncology Associates (AoA), Vida.
- "Percentage of females > 65 years of age with abnormal mammogram with timely follow-up." Required or reported by NCQA.
- "Percentage of patients with goal established at onset of treatment." Required or reported by OnCare.

7. **Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.**

Proposed Measures (early stage)

Evaluation

- > 95% have initial biopsy before total mastectomy. (Biopsy should be aspiration cytology, core biopsy, or excisional biopsy before total mastectomy. A 2-step surgical procedure is not implied.)

Staging

- < 10% have perioperative (within 30 days) bone scan
- < 10% have perioperative (within 30 days) abdominal CT scan

8. **West, Sutherland, et al Measure Set: West JG, Sutherland L, Link JS, Margileth DA. A breast cancer care report care. An assessment of performance and a pursuit of value. *West J Med* 1997;166:248-252.**

Proposed Measures

- % invasive cancers < 15 mm detected on screening mammograms in asymptomatic women aged 50 to 74 years. (Performance target: 60%)
- % of combined stages 0 and I breast cancers detected (stage at diagnosis). (Performance target: 60%)

9. Ma, Bell, et al Measure Set: Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality? *Br J Cancer* 1997;75(11):1652-1659.

Proposed Measures (stage I-III)

- Tumor size reported. (Target: 80%)
- Grade reported. (Target: 75%)
- Excision margins reported. (Target not specified.)
- Number of nodes sampled. (Target: 100%)
- Nodal status. (Target: 100%)
- Tumor size. (Target not specified)
  - < 15 mm
  - 15-40 mm
  - > 40 mm
- Newly presenting patients should not have a bone scan
- Newly presenting patients should not have a liver function test
- Newly presenting patients should not have a liver ultrasound scan
- Use of fine needle aspiration. (Target: 90%)
- Waiting time to hospital. (Target: 50% attend hospital within 14 working days of referral.)

10. ESSO Measure Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109. (European Society of Surgical Oncology.)

Proposed Measures

- "More than 80% of urgent referrals should be seen within 5 working days and 70% of all non-urgent referrals should be seen within 15 working days."
- "Less than 10% of all new breast patients should be required to attend the Clinic on more than two occasions for diagnostic purposes."
- "More than 90% of patients selected for open biopsy should be admitted for operation within 2 weeks of the surgical decision to operate for diagnostic purposes."
- "The benign-malignant operation rate, viz., the number of open surgical biopsies which prove benign to the total number of breast cancers diagnosed on the Unit, should be no more than 1:1 (operations for nipple discharge and abscesses are excluded)."
- "Ninety percent of palpable breast cancers should be diagnosed pre-operatively by cytology or needle histology."

11. BASO Measure Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Proposed Measures

- "To ensure ease of referral to the Breast Unit: The Breast Unit must send details to GPs of how patients can be referred for rapid access. This includes established cases already under the care of the breast clinics, e.g. those with advanced disease."
- "To ensure that *urgent* referrals are seen rapidly: >80% of *urgent* referrals (as deemed urgent by the surgeon), are to be seen within 5 working days of receipt by the Hospital of the referral. If referral letters are sorted by the surgeon to 'urgent' and 'normal' it is a managerial responsibility to ensure that the Surgeon sees the letter shortly after its arrival."
- "To minimize the delay in seeing all new referrals: 70% of all other new referrals to be seen within 15 working days."
- "To minimize the number of outpatient visits for *diagnostic* purposes: If imaging and cytology or needle biopsy are required they should be performed at the initial visit. <10% of *all* new breast patients should be required to attend the Hospital on more than two occasions for *diagnostic* purposes."
- "To ensure that patients attending for diagnostic purposes are seen by a surgeon with special training in breast disease: Patients attending for diagnostic purposes should be seen at least on one occasion by a breast specialist surgeon (consultant surgeon, associate specialist with special training in breast disease) or level 3 trainee in breast surgery. This will be attainable only when numbers of consultant surgeons are increased. At present service demands means that higher surgical trainees are required to see patients in diagnostic clinics. Higher surgical trainees should only give unsupervised opinions in breast diagnostic clinics when judged competent to do so by the supervising consultant. They must *also* have been on the breast unit for at *least 2 months*, to ensure that they have adequate knowledge of local diagnostic protocols."
- "To minimize the interval from a surgical decision to operate for diagnostic purposes and the first offered admission date: >90% should be admitted for an operation within 2 weeks of the surgical decision to operate for *diagnostic* purposes."
- "To produce an FNA sample that can be incorporated into the Triple Assessment process: >90% of FNA samples from lesions which subsequently prove to be cancer should be adequate as deemed by the breast pathologist."
- "To minimize surgical morbidity for impalpable lesions: >90% of diagnostic biopsies *which subsequently prove benign*, for impalpable lesions, should weigh less than 20 g. The Surgeon should ensure that the weight is recorded in theatre or by the Pathologist."
- "To reduce the number of open surgical diagnostic operations: The Benign-Malignant operation rate (this is the number of open surgical biopsies which prove benign to the total number of breast cancers diagnosed on the Unit) should be no more than 1:1 (operations for nipple discharge and abscesses are excluded)."
- "To minimize the number of pre-operative diagnostic frozen sections: 90% of palpable breast cancers should be diagnosed pre-operatively (by cytology or needle histology)."
- "To minimize the interval between diagnostic tests and communication of results: Patients with no abnormality should be given their results at the initial visit (outcome measure: more than 90% of such patients). >90% of patients proving to have breast cancer or an abnormality requiring diagnostic operation, should be told of this within 5 working days of

carrying out investigations which lead to this diagnosis. Patients judged likely to have benign lesions will have been investigated by cytology or needle histology. >90% of patients undergoing these tests should receive their results within 5 working day."

Table 13
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 2: INITIAL SURGICAL TREATMENT

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures (early stage)

- If new diagnosis of breast cancer, estrogen receptor status should be checked.
- If breast conserving surgery, surgical margins should be clear.
- Surgical margin status should influence decisions regarding radiation therapy.
- If stage 0 breast cancer, axillary node dissection should not be performed.
- Patients with nonpalpable breast cancer should be advised of the morbidity associated with the use of axillary lymph node dissection (e.g., arm morbidity) and also of the likelihood that treatment might change, if at all, as a result of axillary lymph node dissection.
- If advanced comorbidity (i.e., life expectancy limited to less than five years) then axillary node dissection is not indicated.

2. FAcct Measure Set: Accountability - In Practice, Breast Cancer. Fall 1996. (Foundation for Accountability.)

Proposed Measures (stage I and II)

- Breast conserving surgery (BCS) rate

4. Guadagnoli, Shapiro, et al Measure Set: Guadagnoli E, Shapiro CL, Weeks JC, Gurwitz JH, Borbas C, Soumerai SB. The quality of care for treatment of early stage breast carcinoma. Is it consistent with national guidelines? *Cancer* 1998;83:302-309.

Proposed Measures (TNM stages I or II)

- Axillary lymph node dissection rate

5. Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with breast cancer with resection with more than 10 nodes." Required or reported by JCAHO, FACCT, Accountable Oncology Associates, Physicians Reliance Network.

- "Percentage of patients with resection for primary lung, colorectal, or breast cancer with staging form." Required or reported by JCAHO.

6. **Potosky, Merrill, et al Measure Set: Potosky AL, Merrill RM, Riley GF, Taplin SH, Barlow W, Fireman BH, Ballard-Barbash R. Breast cancer survival and treatment in health maintenance organization and fee-for-service settings.** ***J Natl Cancer Inst*** **1997;89:1683-1691.**

Proposed Measures (early stage)

- % receiving breast conserving surgery
- if breast conserving surgery, then % receiving radiation

7. **Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population.** ***J Clin Oncology*** **1997;15(4):1401-1408.**

Proposed Measures

Treatment

- > 90% undergo axillary node dissection
- 50% have breast conserving surgery for local disease

8. **West, Sutherland, et al Measure Set: West JG, Sutherland L, Link JS, Margileth DA. A breast cancer care report care. An assessment of performance and a pursuit of value.** ***West J Med*** **1997;166:248-252.**

Proposed Measures

- 50% of patients receiving breast-conserving surgical therapy

9. **Ma, Bell, et al Measure Set: Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality?** ***Br J Cancer*** **1997;75(11):1652-1659.**

Proposed Measures (stage I-III)

- Excision of > 3 nodes if axillary surgery. (Target: 100%)
- Mastectomy for tumors > 4 cm. (Target: 100%)
- "Low mastectomy rate" for tumors < 16 mm. (Target not specified)
- Waiting time from diagnosis to first surgery (or to neoadjuvant chemotherapy or radiotherapy) if less than 2 weeks. (Target: 90%)

10. ESSO Measure Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109. (European Society of Surgical Oncology.)

Proposed Measures

- "A Breast Cancer Unit must have specialist expertise in breast surgery, breast imaging, breast pathology and cytology. Further requirements are access to local oncology services for anti-cancer drugs and quality breast radiotherapy together with the availability of specialist breast care nurses."
- "Formal multi-disciplinary review meetings to consider diagnosis, treatment options and further adjuvant therapy."
- "Ninety percent of patients for therapeutic surgery for cancer should be admitted within 3 weeks."
- "Ninety percent of women having conservation surgery should have no more than two therapeutic operations."
- "The surgeons must ensure that the gross margins are identified without incision into the specimen and that the specimen is carefully orientated according to pathologist's requirements."
- "Free specimen margins should be ensured whether mastectomy or breast conservation is performed. Adequacy of excision is assessed by the pathologist and recorded as the shortest distance from the nearest circumferential margin to any tumour-involved area. This distance should preferably be at least 10 mm on the fresh specimen."
- "Histological node status should be obtained on all primary operable invasive tumours. Minimal requirements are four nodes examined (sampling procedure), but preferably 10 nodes are advised."
- "Prophylactic axillary radiotherapy is inappropriate in cases in which adequate numbers of lymph nodes have been examined by the pathologist to conclude that the patient is histologically node-negative (at least four nodes in BASO guidelines). In DBCG protocols radiotherapy is not administered to the axilla in node-positive patients provided at least 10 nodes have been removed and no grossly involved nodes are left in the axillary cavity."
- "In DCIS a local excision is not appropriate for extensive lesions."

11. BASO Measure Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Proposed Measures

- "Treatment of breast cancer should be carried out by staff with special expertise and training in breast disease: A Breast Cancer Unit must have specialist expertise in breast surgery, breast imaging, breast pathology (including cytology), anti-cancer drugs used for breast cancer, breast radiotherapy and clinical nurse support (breast care nurse)."
- "Multidisciplinary discussion of patients undergoing treatment for primary breast cancer: A formal multidisciplinary meeting to consider the pathology of cases recently operated upon and discuss further treatment attended by members of the breast cancer team involved in primary treatment (particularly Surgeon, Pathologist, Clinical Oncologist and Breast Care Nurse) held weekly."

- "To minimize the interval from a surgical decision that a therapeutic operation is required for cancer: 90% of patients for therapeutic operation for cancer should be admitted within 3 weeks of informing the patient of the need for surgical treatment."

continued...

11. BASO Measure Set (continued):

Proposed Measures

- "To ensure completeness of excision in breast conservation: The surgeon must ensure that the gross margins are identified without incision into the specimen and that the specimen is carefully orientated for the pathologist."
- "To minimize the number of therapeutic operations in women undergoing conservation surgery: The number of operations should be recorded. 90% of women having conservation surgery should have no more than two *therapeutic* operations."
- "To ensure that all necessary data are obtained for making decisions on adjuvant radiotherapy or other systemic therapy: Histological node status should be obtained on all invasive tumours either by sampling or clearance. It is recommended that 'a sample' should contain four lymph nodes that the surgeon has identified and dissection."
- "To ensure the appropriate treatment of ductal carcinoma *in-situ* (DCIS): A local excision is not appropriate for extensive lesions. Axillary clearance or radiotherapy to the chest wall or axilla following mastectomy, are contra-indicated. The surgeon is encouraged to know the criteria for entry to the DCIS trial."

Table 14
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 3: PATIENT CHOICE OF TREATMENT

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

If a new diagnosis of breast cancer:

- prior to decision making regarding the initial surgical treatment for breast cancer is being planned, patients should be informed about the options to have either breast conserving surgery or mastectomy.
- prior to decision making regarding the initial surgical treatment for breast cancer, patients should be informed about the option of a surgical check or removal of lymph nodes under the arm (i.e., axillary node dissection). Patients with Stage 0 disease are exempt.
- prior to decision making regarding the initial surgical treatment for breast cancer, patients should be informed about the option of and benefits of radiation therapy after breast conserving surgery.
- prior to decision making regarding the initial surgical treatment for breast cancer, patients should be informed about the option of breast reconstruction after mastectomy.
- If mastectomy, then patients should be given a choice regarding the use of breast reconstruction.
- If a new diagnosis of breast cancer, prior to surgery, when deciding about her breast cancer surgery and treatments, the provider should show respect for what the patient has to say.
- If a new diagnosis of breast cancer, prior to surgery, when deciding about her breast cancer surgery and treatments, the provider should involve the patient in decisions as much as she wants.

2. FAcct Measure Set: Accountability - In Practice, Breast Cancer. Fall 1996. (Foundation for Accountability.)

Proposed Measures

- Access to radiation oncology consult

7. **Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.**

Proposed Measures

Referral

- > 80% have at least 1 visit to a medical oncologist to discuss adjuvant therapy
- If a mastectomy, > 60% have at least one visit to a plastic surgeon to discuss reconstructive surgery

11. BASO Measure Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Proposed Measures

- "All patients diagnosed with breast cancer should have access to a breast care nurse, preferable pre-operatively: *All* women with breast cancer must be given the opportunity to see a breast care nurse."

Table 15
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 4: RADIOTHERAPY TREATMENTS

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

If breast conserving surgery, willing patients should have radiotherapy.

- If radiotherapy is initiated, radiotherapy treatments should be completed.
- If the patient declines radiotherapy, she should be aware of the risks of local recurrence.

2. FAcct Measure Set: Accountability - In Practice, Breast Cancer. Fall 1996. (Foundation for Accountability.)

Proposed Measures

- Radiation therapy (RT) rate (if BCS)
- Access to radiation oncology consult

4. Guadagnoli, Shapiro, et al Measure Set: Guadagnoli E, Shapiro CL, Weeks JC, Gurwitz JH, Borbas C, Soumerai SB. The quality of care for treatment of early stage breast carcinoma. Is it consistent with national guidelines? *Cancer* 1998;83:302-309.

Proposed Measures

- Radiation therapy after breast conserving surgery (in TNM stages I and II)

5. Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with radiation therapy after lumpectomy." Required or reported by SalickNet, Physicians Reliance Network, OnCare, Vida, and Accountable Oncology Associates.

7. **Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.**

Proposed Measures

Treatment

- > 95% have local radiation following lumpectomy

9. **Ma, Bell, et al Measure Set: Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality? *Br J Cancer* 1997;75(11):1652-1659.**

Proposed Measures (stage I-III)

- Radiotherapy after BCS. (Target: 95%)
- Women should not have radiotherapy to the axilla after axillary clearance. (Target: 100%)

11. **BASO Measure Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13.** (Breast Surgeons Group of the British Association of Surgical Oncology.)

Proposed Measures

- "To avoid unnecessary adjuvant therapy: Prophylactic axillary radiotherapy is inappropriate in cases in which adequate numbers of lymph nodes (at least four) have been examined by the pathologist, to conclude that the patient is histologically node-negative."

12. **MQIS Measure Set: Medicare Quality Indicator System, Health Care Financing Administration. Personal communication with Cindy Wark, Director of the Division of Division of Acute and Chronic Disease Management, Clinical Quality Measures Group, Office of Clinical Standards and Quality, Health Care Financing Administration, December 22, 1997.**

Proposed Measures

- Radiation therapy following breast conserving surgery.

Table 16
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 5: CHEMOTHERAPY TREATMENTS

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

- If newly diagnosed breast cancer, patients should be advised of the benefits and risks associated with the use of chemotherapy stratified by lymph node status where lymph node status is known.
- If visit with a medical oncologist, discussion of all of the following: chemotherapy, tamoxifen therapy, combination of chemotherapy and tamoxifen therapy, no treatment.

4. Guadagnoli, Shapiro, et al Measure Set: Guadagnoli E, Shapiro CL, Weeks JC, Gurwitz JH, Borbas C, Soumerai SB. The quality of care for treatment of early stage breast carcinoma. Is it consistent with national guidelines? *Cancer* 1998;83:302-309.

Proposed Measures

- Chemotherapy for pre-menopausal women with positive lymph nodes (in TNM stages I and II)

5. Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with adjuvant therapy for breast or Duke's cancer." Required or reported by SalickNet, Physicians Reliance Network, OnCare, Vida, and Accountable Oncology Associates.

7. **Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.**

Proposed Measures

Adjuvant Chemotherapy

- If premenopausal and > 1 axillary nodes (+), then > 90% receive chemotherapy
- If postmenopausal and > 1 axillary nodes (+), then 50% receive chemotherapy

Referral

- > 80% have at least 1 visit to a medical oncologist to discuss adjuvant therapy

9. **Ma, Bell, et al Measure Set: Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality? *Br J Cancer* 1997;75(11):1652-1659.**

Proposed Measures (stage I-III)

- Chemotherapy or ovarian ablation for pre-menopausal women who are node-positive. (Target: 100%)

Table 17
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 6: TAMOXIFEN TREATMENTS

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

If breast cancer and not known to be hormone receptor negative:

- patient should be prescribed tamoxifen.
- patient should initiate the use of tamoxifen.
- patient should continuously use tamoxifen for at least two years unless intolerable side effects.

4. Guadagnoli, Shapiro, et al Measure Set: Guadagnoli E, Shapiro CL, Weeks JC, Gurwitz JH, Borbas C, Soumerai SB. The quality of care for treatment of early stage breast carcinoma. Is it consistent with national guidelines? *Cancer* 1998;83:302-309.

Proposed Measures

- Hormonal therapy for post-menopausal women with positive lymph nodes and positive estrogen receptor status

5. Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with adjuvant therapy for breast or Duke's cancer." Required or reported by SalickNet, Physicians Reliance Network, OnCare, Vida, and Accountable Oncology Associates.

7. Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.

Proposed Measures

Referral

- > 80% have at least 1 visit to a medical oncologist to discuss adjuvant therapy

9. **Ma, Bell, et al Measure Set: Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality? *Br J Cancer* 1997;75(11):1652-1659.**

Proposed Measures (stage I-III)

- Tamoxifen for post-menopausal women who are node-positive. (Target: 100%)

Table 18
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 7: CARE FOLLOWING INITIAL SURGERY/RADIOTHERAPY

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

- If treatment for breast cancer, then adequate coordination of care
- If home health care or assistance is needed for help with bathing or dressing or basic household tasks, home health care or assistance is readily given.
- If home health care or assistance is delivered, the quality of the home health care is good or better.
- If home health care or assistance is needed for help with bathing or dressing or basic household tasks, and if home health care is not delivered, was home health aide given?
- If treatment for breast cancer, then at least one clinical breast exam beyond the immediate treatment period.
- If treatment for breast cancer, then at least one follow-up mammogram approximately one year after diagnosis.
- If treatment for breast cancer, then at least one visit with a cancer specialist.

5. Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with more than stage 1 breast cancer with mammogram < 18 mos. postoperative." Required or reported by Accountable Oncology Associates.

7. Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.

Proposed Measures

Referral

- If stage I or II breast cancer treatment, > 95% have mammography within the first 18 months postoperatively.
- If stage I or II breast cancer treatment, < 15% have bone or CT scans for suspicious symptoms per year.

10. ESSO Measure Set: Blichert-Toft M, Smola MG, Cataliotti, O'Higgins N. Principles and guidelines for surgeons – management of symptomatic breast cancer. *Eur J Surg Oncol* 1997;23:101-109. (European Society of Surgical Oncology.)

Proposed Measures

- "The surgeon must ensure that adequate follow-up is provided."
- "There must be involvement by the surgical team in the follow-up of patients treated with breast conservation."
- "In breast conservation mammography should be an integral part of follow-up and the intervals should be determined."
- "After definitive surgery in primary operable breast cancer fewer than 10% of patients develop local recurrence within 5 years."
- "There should be a written protocol to identify those patients at high risk of chest wall and axillary recurrence. Prophylactic radiotherapy can be employed in these women."
- "Axillary recurrence after formal level I-II node dissection should be less than 5% at 5 years and should approach zero when formal level I, II and III dissection is carried out."
- "Surgeons must obtain adequate information about lymph node status in the axilla and employ appropriate adjuvant treatment when the nodes are invaded by cancer."

11. BASO Measure Set: Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Eur J Surg Oncol* 1995;21(Suppl. A):1-13. (Breast Surgeons Group of the British Association of Surgical Oncology.)

Proposed Measures

- "Following the treatment of a primary tumour, patients should have easy access to the Breast Team at any time: Patients should receive written information on how to access the breast care tam (which may be through the Breast Care Nurse)."
- "To ensure that symptoms of recurrent disease lead to a correct diagnosis: Written guidelines on the detection of recurrence (local, regional and distant) must be given to all medical staff engaged on the follow-up clinic."
- "To minimize the development of local recurrence in the conserved breast: < 10% of patients developing local recurrence within 5 years."
- "To ensure early and accurate diagnosis of any local recurrence: the surgeon must ensure that adequate follow-up is provided. There must be involvement of the surgical team in the follow-up of patients treated with breast conservation."
- "To minimize the development of local recurrence after mastectomy: < 10% of patients with primary operable breast cancer developing local recurrence within 5 years. There should be a written protocol which identifies those patients at high risk of flap recurrence. Prophylactic radiotherapy can then be employed in these women."

Table 19
PROPOSED MEASURE SETS BY DOMAIN

DOMAIN 8: TREATMENT OF MORBID AND COMORBID SYMPTOMS, SIGNS, AND CONDITIONS

1. RAND Measure Set: RAND/HCFA Outcomes Project team

Proposed Measures

- If persistent arm pain associated with decreased function or impaired mood following breast cancer treatment, adequate physical examination should be performed including range of motion and patient should be referred to physical therapy for evaluation and treatment.
- If vaginal bleeding and using tamoxifen, patient should be aware that provider should be notified within weeks of the onset of the first episode of bleeding.
- If vaginal bleeding and using tamoxifen, patient should be evaluated for endometrial cancer.
- Patients at high risk should be examined and queried for the presence of arm edema. Patients at risk should be instructed in: a) relative risk of arm edema, b) importance of reporting to providers the development of new or worsening arm edema, c) preventive measures.
- Patients, particularly those at risk, should be aware of preventive measures.
- Breast cancer patients at risk should be assessed for the presence of lymphedema routinely. Providers should query their breast cancer patients regularly regarding the presence or absence of arm edema.
- Interventions should be made available to patients with lymphedema. There is not enough evidence to advocate a particular follow-up treatment if standard therapy and complex physical therapy are ineffective.
- Ongoing patient assessment and exploration of treatment options should be evident.

5. Kurowski Measure Set: Kurowski B. Cancer carve outs, specialty networks, and disease management: A review of their evolution, effectiveness, and prognosis. *Am J Managed Care* 1998;4:SP71-SP89.

Proposed Measures

Common Process Performance Measures

- "Percentage of patients with breast cancer with referral to psychosocial services." Required or reported by Accountable Oncology Associates.
- "Percentage of patients with pain scale in chart/follow-up." Required or reported by Accountable Oncology Associates and Physicians Reliance Network.

7. **Hillner, McDonald, et al Measure Set: Hillner BE, McDonald K, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring standards of care for early breast cancer in an insured population. *J Clin Oncology* 1997;15(4):1401-1408.**

Proposed Measures

- If a mastectomy, > 60% have at least one visit to a plastic surgeon to discuss reconstructive surgery

9. **Ma, Bell, et al Measure Set: Ma M, Bell J, Campbell S, Basnett I, Pollock A, Taylor I. Breast cancer management: Is volume related to quality? *Br J Cancer* 1997;75(11):1652-1659.**

Proposed Measures (stage I-III)

- Offer of breast reconstruction. (Target presumed to be 100%)
- Availability of facilities for patient support. (Target presumed to be 100%)
  - Specialist breast nurses
  - Prosthetics service
  - Lymphoedema service
  - Information leaflets for patients

Table 20
SUMMARY OF QUALITY OF LIFE/PSYCHOSOCIAL OUTCOMES FOR BREAST-CONSERVING SURGERY VERSUS MASTECTOMY

	BREAST CONSERVING SURGERY				
	Yes Radiation Therapy	Yes Radiation Therapy	Yes Radiation Therapy	Radiation Therapy Not reported	Radiation Therapy Not reported
	COMPARED WITH MASTECTOMY				
	Immediate Recon-struction	Delayed Recon-struction	No Recon-struction or not reported	Yes Recon-struction, time not reported	No Recon-struction or not reported
OUTCOMES					
PSYCHOSOCIAL					
Body image	Pos[69]	NSError! Bookmark not defined.	NS[70] PosError! Bookmark not defined.,Error! Bookmark not defined.,71,	NS[72] Pos[73]	PosError! Bookmark not defined.,[74]
Self-concept	NSError! Bookmark not defined.	NSError! Bookmark not defined.	NSError! Bookmark not defined.		
SEXUAL					
Sexual desirability				PosError! Bookmark not defined.	NSError! Bookmark not defined.
Sexual relations			NSError! Bookmark not defined.	NSError! Bookmark not defined.	NSError! Bookmark not defined.
Satisfaction with sexual life			NSError! Bookmark not defined. PosError! Bookmark not defined.	NSError! Bookmark not defined.	
Sexuality					NSError! Bookmark not defined.
Satisfaction with marriage/ relationship			NSError! Bookmark not defined.		
Loss of libido			NegError! Bookmark not defined.		
EMOTIONAL					
Psychosocial adjustment				NSError! Bookmark not defined.	
Perceptions of social support			NSError! Bookmark not defined.,Error!		

			Bookmark not defined.		
Psychological complaints			NSError! Bookmark not defined.,Error! Bookmark not defined.	NSError! Bookmark not defined.	NSError! Bookmark not defined.
Mood disturbance			NSError! Bookmark not defined.,Error! Bookmark not defined.		
Anxiety			NSError! Bookmark not defined.		
Self-rated emotional state			NSError! Bookmark not defined.		
Fear of recurrence			NSError! Bookmark not defined.		NSError! Bookmark not defined.
PHYSICAL FUNCTION/QOL					
Quality of life			NSError! Bookmark not defined.,Error! Bookmark not defined.,Error! Bookmark not defined.,[75]		
Life satisfaction			NSError! Bookmark not defined.		
Physical discomfort			NSError! Bookmark not defined.		
Physical state			NSError! Bookmark not defined.		
Activity level			NSError! Bookmark not defined.		
Functional status			NSError! Bookmark not defined.,Error! Bookmark not defined.,Error! Bookmark not defined.		
Problems with clothing			NegError! Bookmark not defined.		

Note: Pos = significant positive effect; Neg = significant negative effect; NS = no significant effect

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